SHORT-WAVE
RECEIVERS,
CONVERTERS,
ADAPTERS

Vintage Radio Identification SKETCH-BOOKS of D. H. MOORE

VOLUME III

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DEDICATION

.....to a way of life
that should not have
been forgotten.

Acknowledgements

Bits and pieces of these volumes have been published, referenced, reviewed in several media devoted to the hobby of vintage Radio, including a few foreign countries, such as New Zealand, Japan, Canada and England. Such favourable notice for such a labour of love is hereby acknowledged in appreciation.

Thanks must also be offered Stan Lopes who tediously editted the technical authenticity of circuitry to be found in Volumes II through VII. His labours have resulted in an obvious authenticity, we feel, especially for those who delight in tracing out vintage schematics. He even found technical errors in original sources!

Special thanks are due Douglas G. Yule, who originally sponsored this effort as a contribution to the hobby, without whose prompting these Sketch-Books may not have come into existence. Also, thanks are given to Howard W. Granoff, of the OLDE TYME RADIO COMPANY, whose unflagging enthusiasm and publicity has done much to make these Sketch-Books known within the fraternity.

And in as much as fraternalism is the basis for shared enthusiasm, which is what any hobby is, and because of the original and dramatic shift away from the current vintage Radio fare, it follows that the publishers and the author, being human, would appreciate hearing from you, your comments, along with any suggestions you'd care to offer with an eye to producing bigger and better vintage Radio literature in future.

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THE UBIQUITOUS SHORT - WAVE ADAPTER....

was rarely effective, but was extremely popular well into the Thirties. The cut above depicts one of the more conventional configurations, offered by several manufacturers, for prices ranging from $5 to $57, and most of equal merit.

Frontispiece

SHORT-WAVE CONVERTERS

Despite the adventuresomeness of many early radio pioneers genuine advances in the state-of-the-art were never a straight-line or predictable continuum. Many discoveries were made by accident or, even by happenstance. And whenever a new "discovery" was reported, there as could be expected, a mad rush to modify existing circuitry or invent a so-called "new" one to duplicate the new discovery. All such frenetic activity was dutifully reported in early Radio media.

Much phenomena were not new, of course - simply being undiscovered, and this lack of awareness was one of the early limitation bounderies set by ignorance. The art, even in its modern guise as "electronics", is still limited by electro-mechanical phenomena and certain immutabal natural laws. The advent of the transistor, for example, replacing the vacuum tube has not altered by one jot phenomena governing radio circuit functions.

Among early attempts to overcome the inherent limitations of early circuits was a plethora of add-on units, frequently not much more than gadgets, ranging from antenna couplers, pre-selectors, audio muters, sensitivity enhancers, to short-wave converters and adapters.

The number of major and minor short-wave converters was an impressive figure, even though most converters worked rather poorly or not at all. But so great was the fascination of early Radio that most any claim would always find an immediate audience.

By the late Twenties the short-wave adapter was on the way out and the short-wave converter was in the ascendency. There were at least 100 kits offered, along with manufactured units by such companies as Pilot, Aero, Dresner, Stromberg-Carlson, Stewart-Warner, Baird, Silver-Marshall, Erla, Majestic, and on and on. I have several units in my collexion of those mentioned, plus many I have constructed from original schematics, and with no reservation I would say that the one produced by Stromberg-Carlson, Model 69, is far and away the best.

First off, a re-definition of terms might be in order, as even today one hears the two terms used as though they were interchangble. They have little in common, save in their intended function. I offer you the following definitions as a guide:

ADAPTER: a device utilising the DET tube from the set and feeding the signal to the AF stages; the device functioned as a regenerative receiver.

Among the factory-made adapters of merit were those from Flewelling, Walker, Dresner.

CONVERTER: essentially a tuned local oscillator and modulator, or first detector. The oscillating tube functioned as an RF frequency changer, heterodyning with different incoming signals, resulting in a beat-note for any setting of the oscillator. Some Converters were designed to produce a "frequency difference" of both oscillating and tuninf controls. By mixing the signal and oscillator frequencies in a modulator, an IF was created. The receiver was tuned to this difference, which was between 600 and 190 M.

All converters, with a couple of weird exceptions, employed a seperate detector and an oscillator, using fixed or plug-in coils wound for different band ranges. Some employed a third stage of RF in front of the DET. In passing, I might mention that many a maritime operator carried his personal SW converter with him.

Those converters employing a stage of RF, tuned or untuned ahead of the OSC and first DET were the better designs. An early methof of reducing interference with an untuned RF input converter was to employ a tuned RF output transformer, in the form of a conventional or solenoid-type coil at the output posts. But no SW converter was better than the receiver with which it was used.

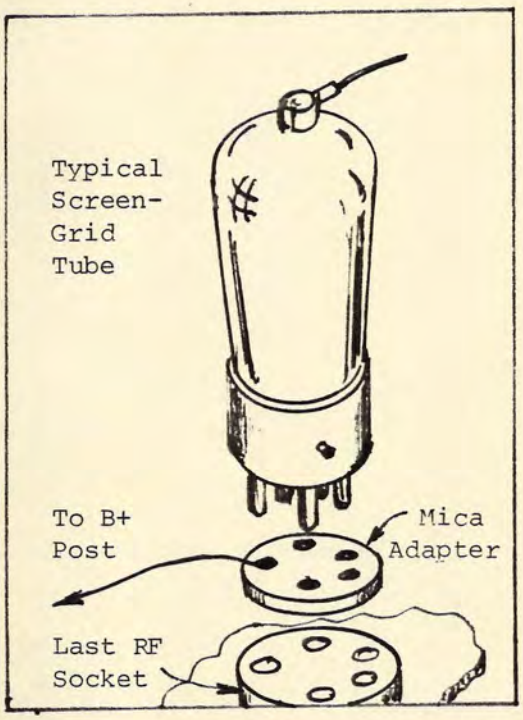
Some converters worked best with the receiver dials placed around 500 KC, 1000 KC, 1200 KC; or, the most popular setting, 1500KC. Very few of the early converters would work well with early super-hets unless there was, in the receiver, some amplification ahead of the 1st DET. With a stage of amplification following the converter's output, a BFO produced by the converter could be amplified to 1500 KC., which in turn would be changed by the super-het circuit to the IF of the set.

There were two favoured methods used in early converters to change bands: the plug-in coil or the tapt ANT switch attached from the ANT coil. In the latter, the connexion between the tap-switch knob and the contacts had to be perfect. Even slight corrosion or a partial contact would cause a lack of oscillation, broad tuning, insensitivity.

When the RF sexion of the receiver was used as the IF amplifier of the converter's output, the receiver's dials were usually at 1500 KC. Then, only the receiver's VOL control was used. Some converters acted only as a broadcast signal booster, which was quite a common ploy, albeit deceptive.

If the receiver used screen-grid tubes, B+ was usually but

not always, taken from the receiver. If general purpose tubes were used in the receiver, plate voltage was taken from one of the plate circuits in the receiver. For battery sets, either method would work. If a seperate "B" battery was used for the converter, the (-) post was connected to GND, and the (+) post of the converter went to GND through a 1MFD condenser. One method for getting B+ from the receiver is shown below.



When the converter used a built-in plate voltage supply the rectifier tube was always the first thing to suspect. Perfect filtering was essential, - as any hum present would modulate the BFO, destroying the tuning.

Regeneration in the set would set-up a squeal on a SW signal, - and end-up as the familiar or frequent AF howl, which could not be suppressed by the usual methods of placing a resistor across the AF transformers. Disconnecting the GND wire was frequently recommended, as it was early on discovered that GND wires would pick-up man-made noises from electrical applicances, motor-cars, trolley-cars, power lines.

One of the many peculiarities of the home-constructor was his carelessness in the placement of parts in a converter. The placement of parts was highly critical in most any of the early units. One cardinal rule was that any coil should be at least 2X its radius from the tuning condensers, and other metal. Wiring had to be short and straight, and a metal panel or chassis could not be depended on as a conductor for RF circuits. It was also discovered that the preferred square buss-bar would not work in RF links, but had to be wire, all gathered together and connected at one point on a metal panel.

The ANT was and is a critical factor in SW reception. Firms such as RCA, GE, Lynch, Philco, Scott produced so-called SW antenna systems or gadgets, but the "Zep" seems to have been the first SW antennae designs whose results were immediately apparent when hooked-up. The conventional flat-top ANT often proved a hinderance to the performance from early converters. However, it should be mentioned that "ZEP" system was most effective when the removal of the GND wire did not upset the stability of the converter or the receiver; or did not result in that great bug-bear of early Radio - hum.

* * *

RANDOM OBSERVATIONS ANENT SHORT-WAVE CONVERTERS

To Use A SW Converter:

1. Make certain all connexions are secure.
2. Turn on both sets simultaneously.
3. A rushing sound should be heard. If no sound is heard, rotate receiver dials for the most sensitive reception of noise.
4. Adjust receiver volume. Back it off to control circuit oscillations, which may be recognized as a feeble hiss and lack of signal.
5. Turn the converter tuning dial with extreme care. One division of the dial on early converters usually represented 100 KC, thus suggesting that signals could be passed over rather quickly. Scott, I remember, was very "big" on admonishing his purchasers to always tune his SW receivers V-E-R-Y S-L-O-W-L-Y. The admonishment was repeated several times in his instructions to the purchaser.

* * *

The mixer-type converter had the greatest applicability and greater assurance of getting results.

Not every adapter or converter would work with every receiver. The criterion was always how great was the amplification of the detector?

With a DC converter and an AC receiver, separate power supply units should be used for each, as well as a separate filament supply.

When the receiver detector was of the power-type, sensitivity would falter when there was only one stage of AF amplification.

Early converters will not work with modern BC receivers - "modern" being from the mid-Thirties onward.

Filament voltage for an ADAPTER tube must always be the same as the receiver's "A" voltage.

With DC receivers, adapters should only be used wherein the grid-leak and condenser method of detection was used.

Single tube adapters were capable of pulling in CW or voice. For CW, it was only necessary to advance the regeneration control; for voice, it was necessary to control the oscillation.

Some early detectors used in converters were of the 27 type. Replacing the 27 with a 24A would greatly increase sensitivity. The screen-grid of the 24A should be fed from the high voltage connexion through a 50K resistor, and a bleeder resistor of 30K should connect the grid to ground. The by-pass for the bleeder should be 0.1 MFD. A change in the value of the grid-leak sometimes showed an improvement.

A choke coil should be inserted between the adapter tube plate and B+, but NOT an RFC. This is not applicable to the super-het type converters, where the choke coil is omitted.

No resistance should be present in the A+ leg of the filament circuit. If there is, it should be removed by short-circuit. If the A+ leg incorporates a rheostat, it should be set at zero.

When using a 27 detector, plate return from the oscillator should be connected to voltage of 50V from the voltage divider.

The 2.5V tubes used in some early converters will hum less when the filament winding is center-tapt, and the tap connected to GND.

If the variable tuning condenser causes hissing, the plate voltage is too high. If no hiss is heard, only clicks or hum, the plate voltage is also too high, or the grid-leak is wrong.

If regeneration occurs when plugging-in the adapter with a cable-plug, it can be smoothed out with a rheostat in the A+ leg of filament circuits. (T.R.F.'s only.)

If regeneration is erratic, try various grid-leaks.

A 3K trimmer/padder inserted in the GND. lead will sometimes improve the reception.

When the adapter had both tuning and regeneration controls, both dials shouls be rotated simultaneously.

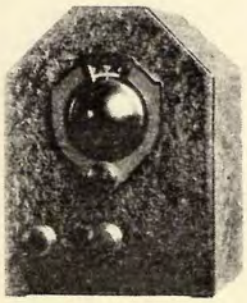
When a converter produces whistles, placement of a 0.0001 to 0.001 MFD capacitor across the SEC of the AF transformer can help.

The presence of regeneration in the receiver will cause a squeal on the SW signal, and may evolve into acoustic howl.

Never place a converter or adapter on the receiver.

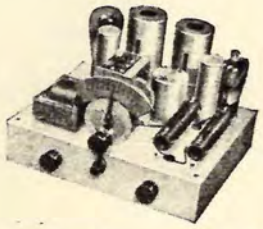
The shorter wavelengths require sharper tuning.

NOTE: For coil-winding data not shown on the various schematics herein, refer to Volume VII for commercial coil data that could be applicable to many of these circuits.

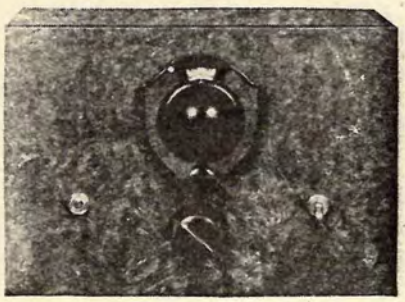


R.S.L.

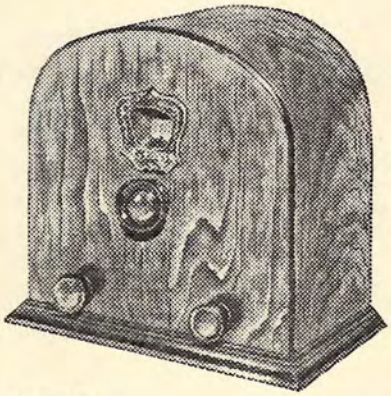
REPRESENTATIVE EARLY SHORT-WAVE CONVERTERS



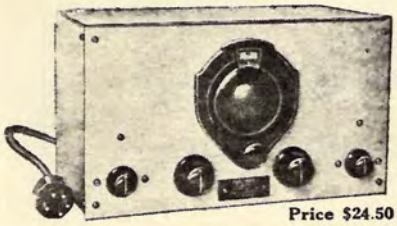
MIDWEST - $16.75



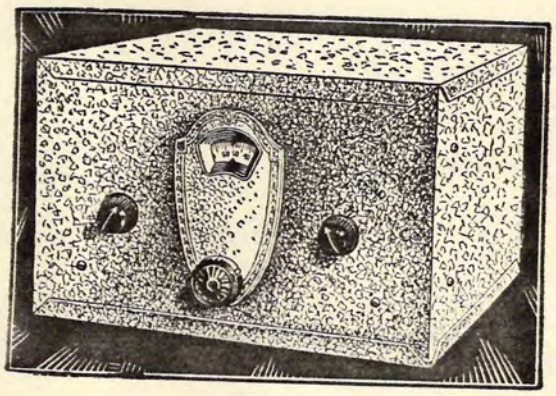
AERO - $12.50



"GEM"
$26.50

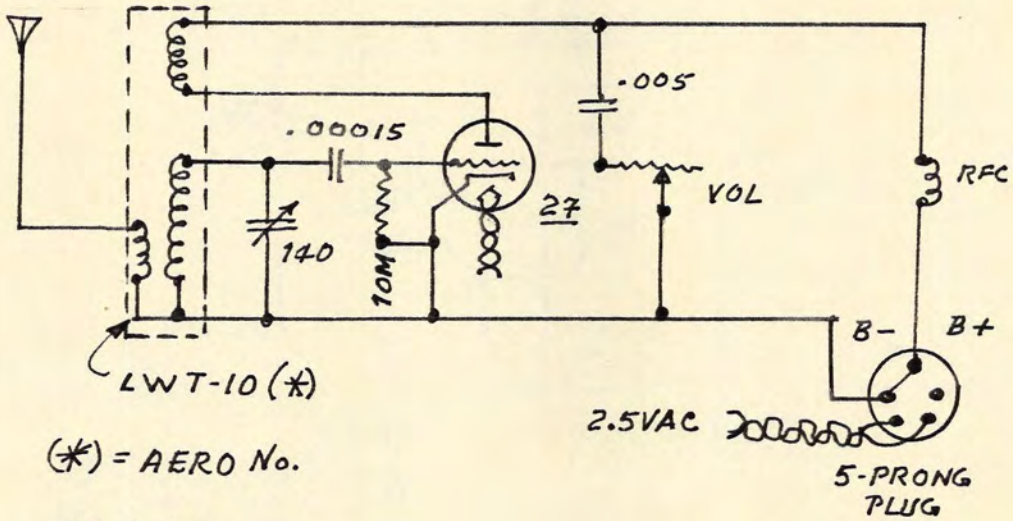


"EXPLORER"



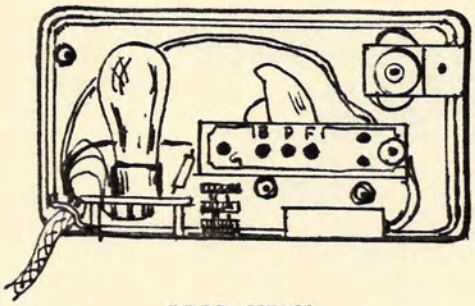
SILVER-MARSHALL

AERO SW. CONVERTER, MODEL #14, 1929

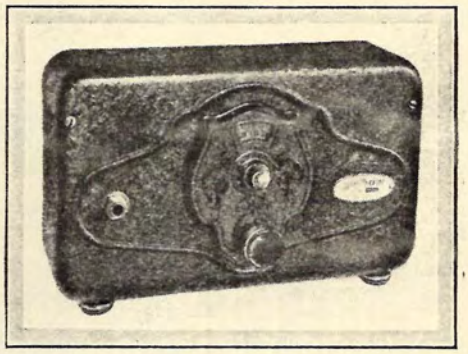


(*) = AERO No.

CB 4-29
CB 9-29



RERE VIEW



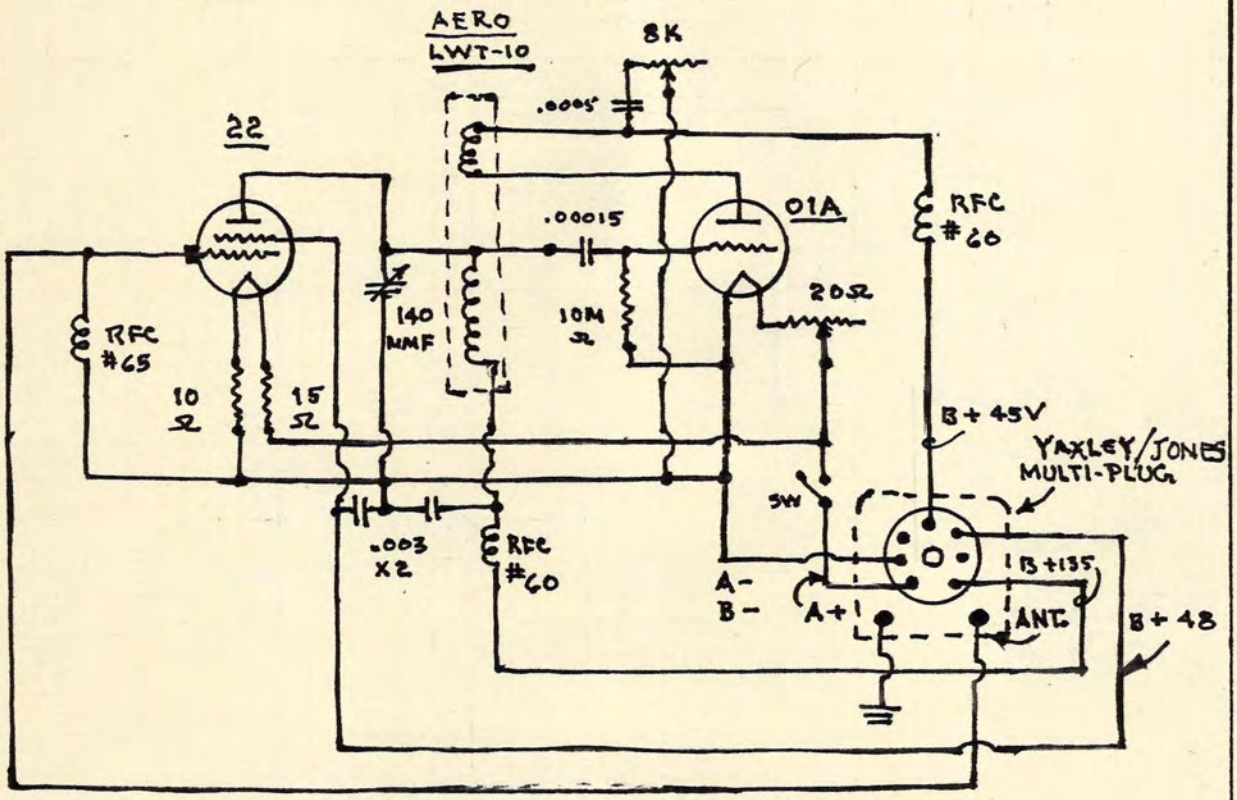
EMBOSSED METAL CABINET.
CABINET = 9" x 5½" x 2½".
ORIGINAL COST = $25.

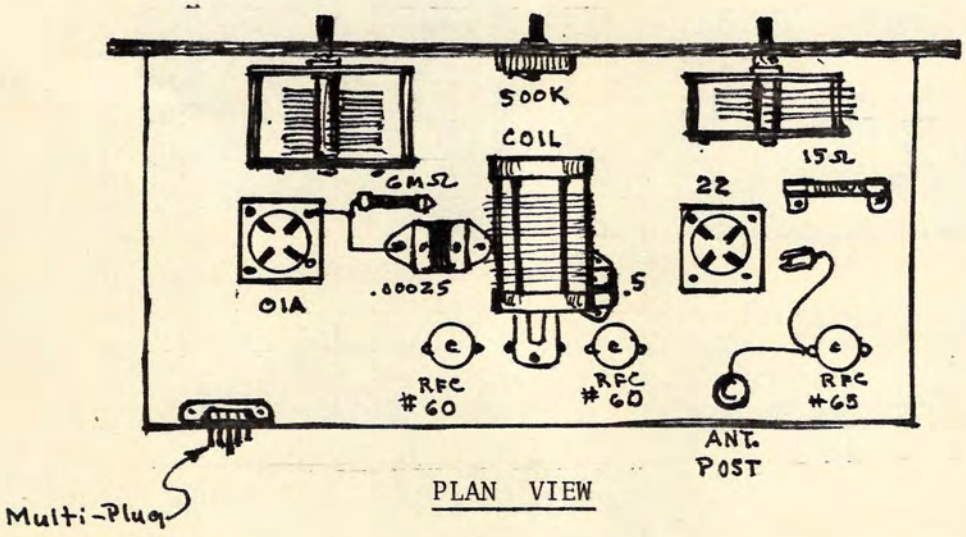
Coil Form = 2" Ø, horizontal mounting on rere of cabinet.

Coils Classified As Follows:
Smallest = 16.5 - 32 Meters; 4T
Medium = 26.2 - 47.9 Meters; 9T.
Largest = 46.7 - 90 Meters; 18T.

PRI windings are moveable with respect to SEC and TICK coils; PRI coil is used for all coils.

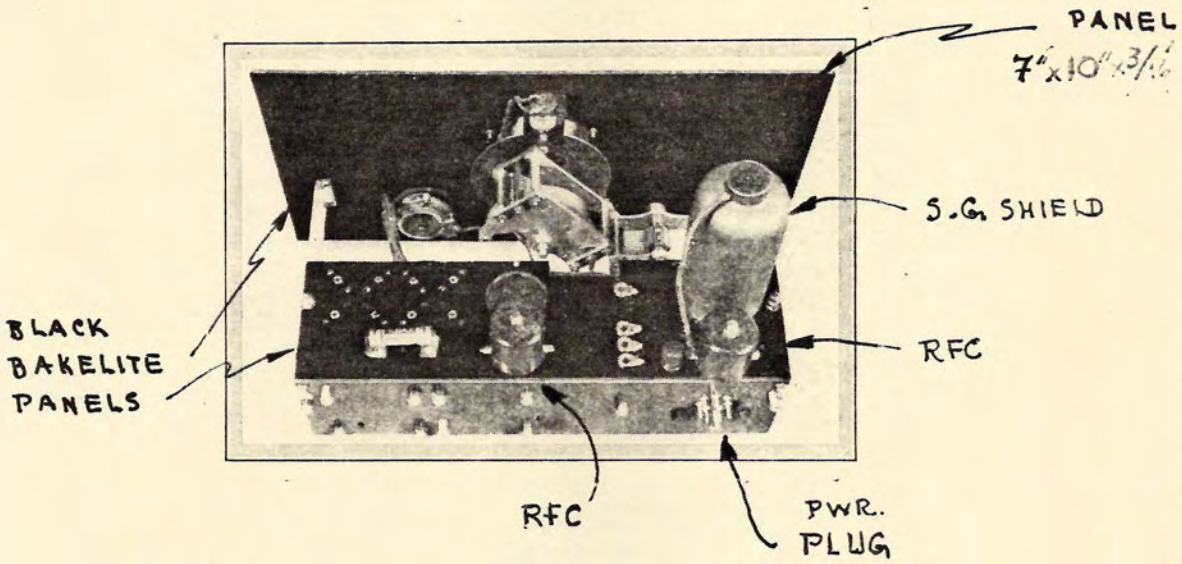
AERO SW. CONVERTER #9, 1928
(16.5 to 600 Meters)



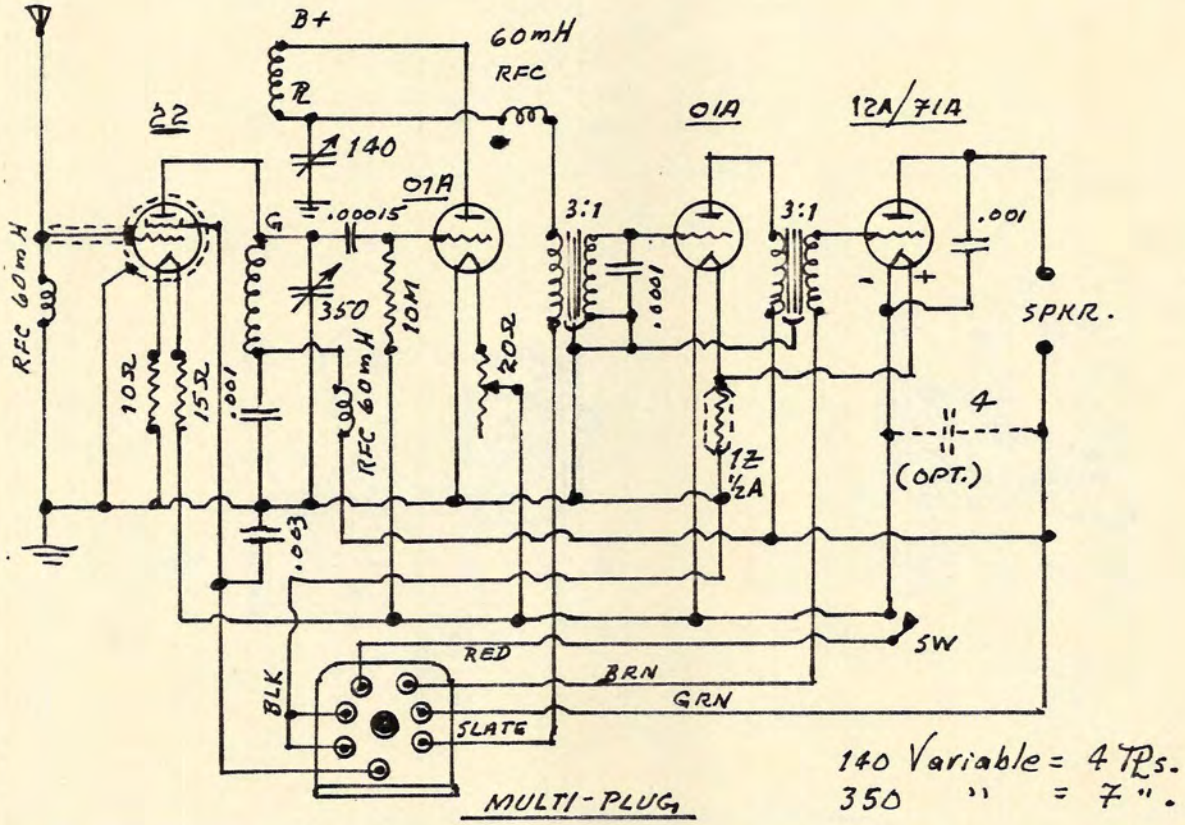


PLAN VIEW

AERO "INTERNATIONAL FOUR", 1929; Sht.1



REAR VIEW



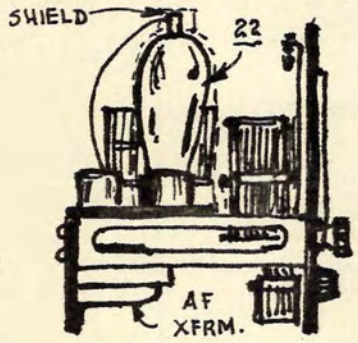
AERO "INTERNATIONAL" FOUR, 1929; Sht.2

NOTES:
1. Original grid-shield was by Carter.
2. AF xfrmrs., fixed resistors, and fixed capacitors were mounted under sub-panel.
3. Sub-panel was cut-out to accomodate variable plates.
4. AF tubes plugged into flush-mounted sockets; 01A and 22 tube used conventional sockets; coil sckts. flush.
5. Original dials were Kurz-Kash "Aristocrat" series; second model used Natiomal "E" dials. (The only difference between the two models of the "International Four" was that in the second model the 22 tube was enclosed in a shield, usually by Goat Mfg. Co. - at 5¢ a piece!
6. Colour Code of Original Power Cables:

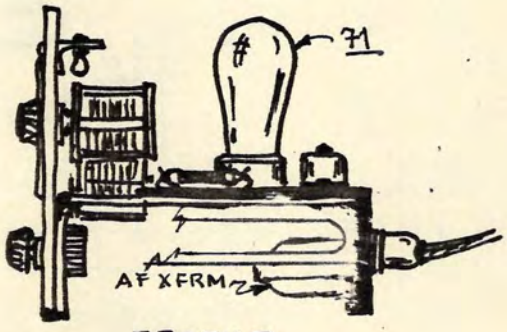
Yellow	=	A-, B-
Black	=	C+
Brown	=	C- 6V
Red	=	A+ 6V
Blue	=	B+ 45V
Slate	=	B+ 67.5V
Green	=	B+ 135V

7. If AF howl occurs, connect a 50K/100K resistor across 2nd AF transformer, preferable "G" and "F" terminals.
8. Coil Designations & Ranges:

LWT-10	=	17 - 89 Meters
INT-104	=	80 - 205 Meters
INT-4 & -5	=	Broadcast Band.

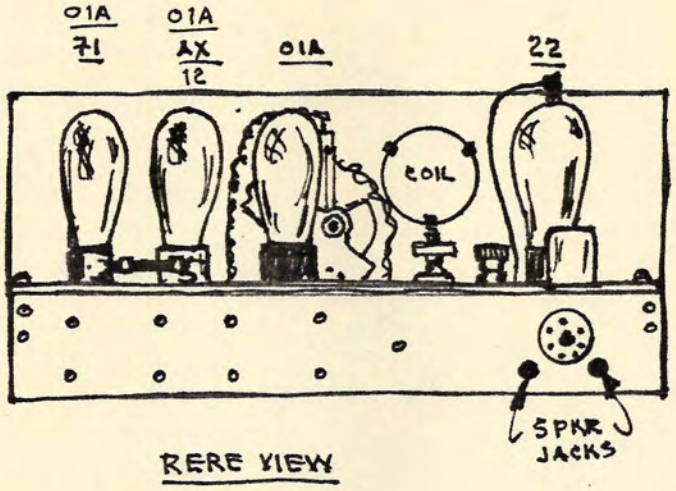


PROFILE
(L.H.)

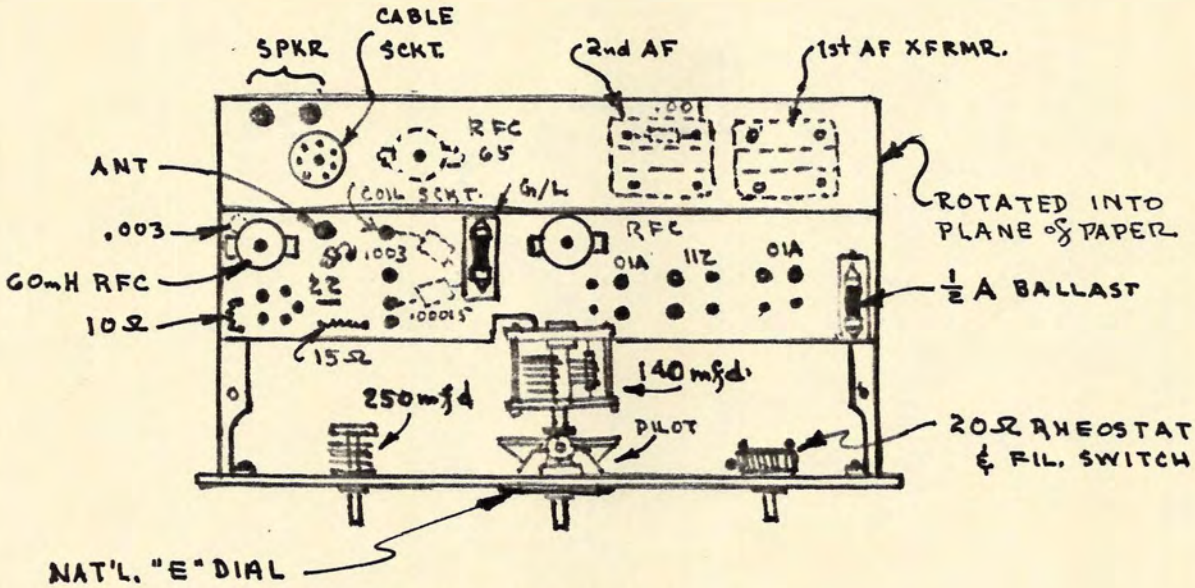


PROFILE
(R.H.)

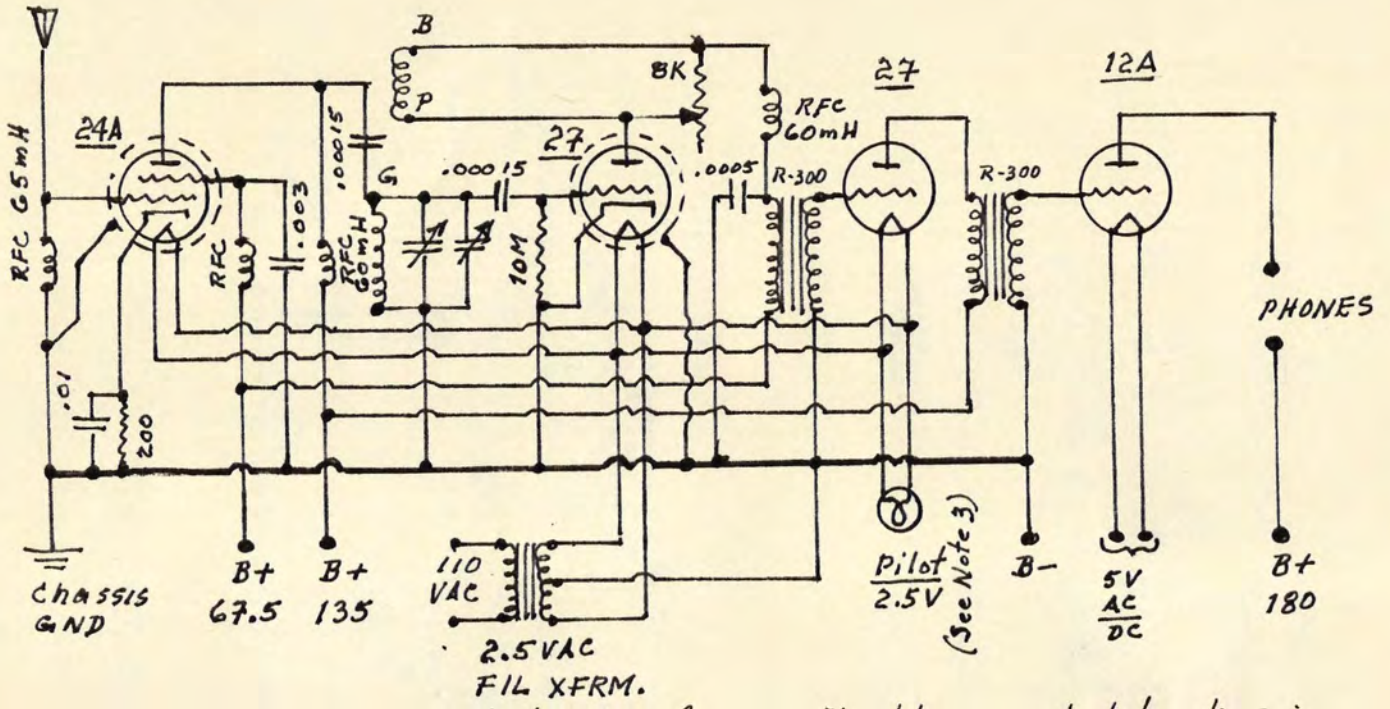
AERO "INTERNATIONAL FOUR", 1929;#8,Sht.3



REAR VIEW



PLAN VIEW



BOTH VARIABLES = 135 mmf./140 mmf.
THORDARSON AF XFRMRS.

Shields grounded to chassis.

AERO "OVERSEAS FOUR" SW. RECEIVER, 1929

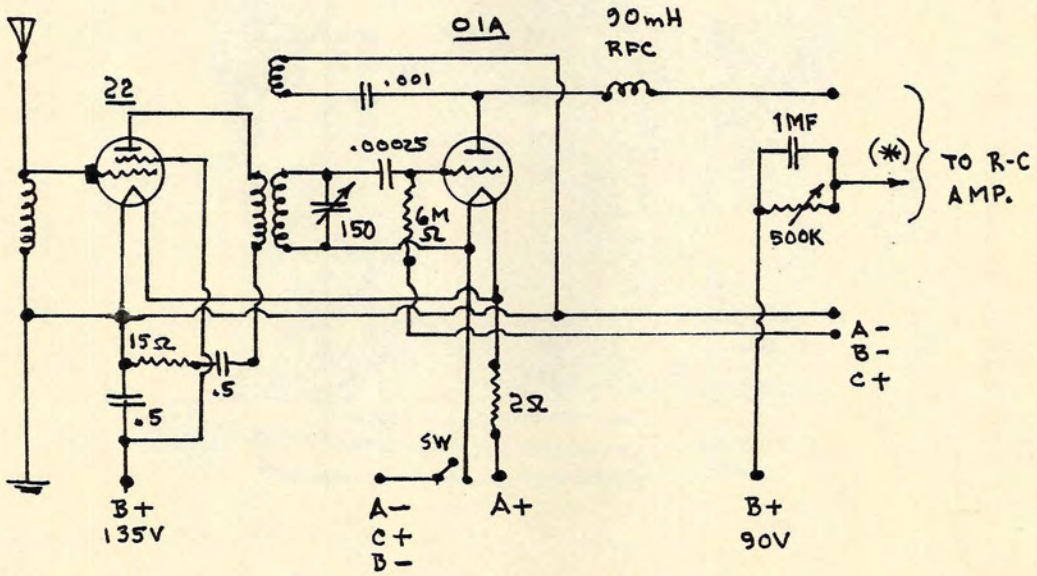
NOTES:

1. A hissing sound denotes oscillation.
2. VOL and REGEN controlled by 8K pot.
3. Pilot may be taken off 5V line with 6V bulb.
4. Allow for a tube warm-up period.
5. Antenna should be 60' - 100' & 16' to 50' high.
6. All-metal chassis.

CAUTION

This receiver was very unstable. Do not hit or jar chassis when set is on.

AERO 2-TUBE SW. RECEIVER, 1928

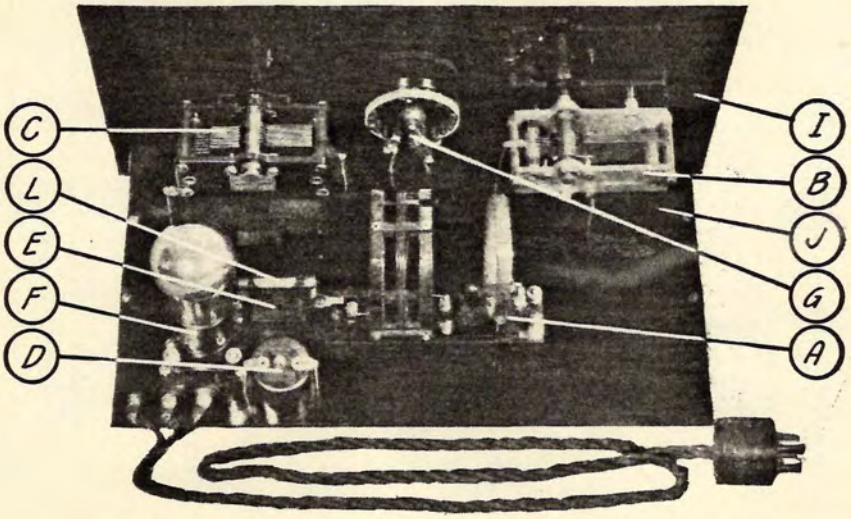


NOTES:

1. The DRESNER SW. receiver employed a similar circuit.
2. An AF amplifier was required for this tuner; AERO recommended a resistance-coupled type.
3. AERO plug-in coils were used.

(*) = To bottom of first resistor in R/C AF amplifier.

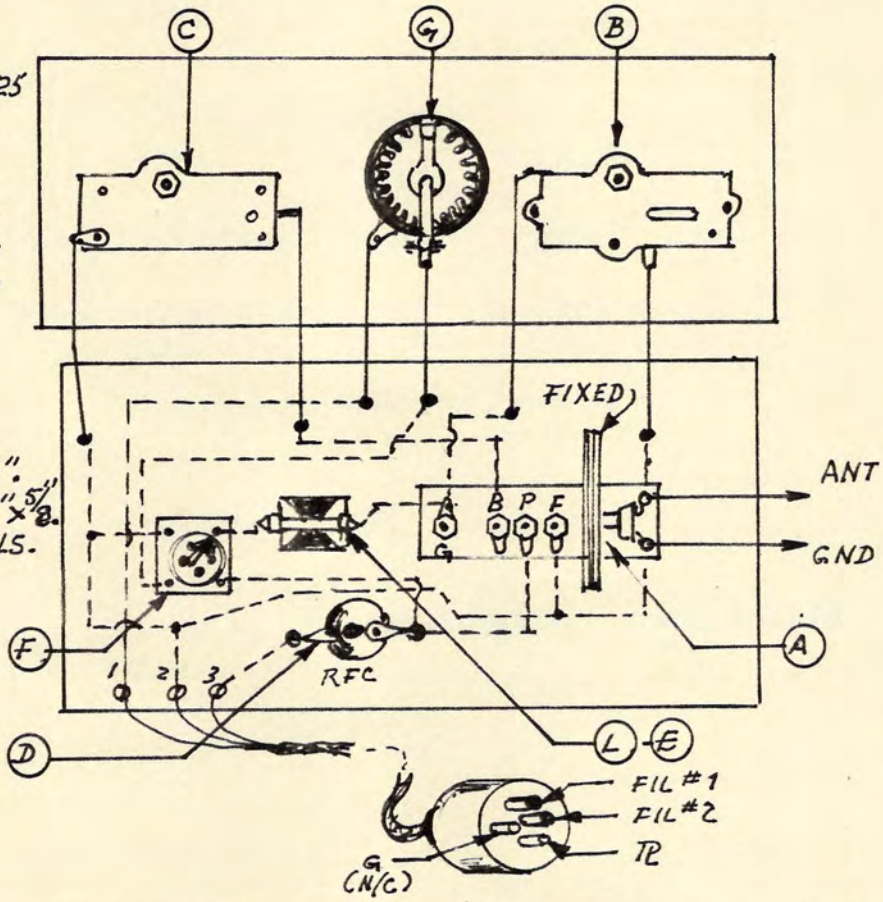
AERO SHORT-WAVE CONVERTER, 1928



A = AERO LWT-125 COIL ASSY.
B = AMSCO 140.
C = AMSCO 250.
D = AERO RFC.
E = .0001 MFD.
F = SCKT.
G = 25Ω.
L = 5MΩ.

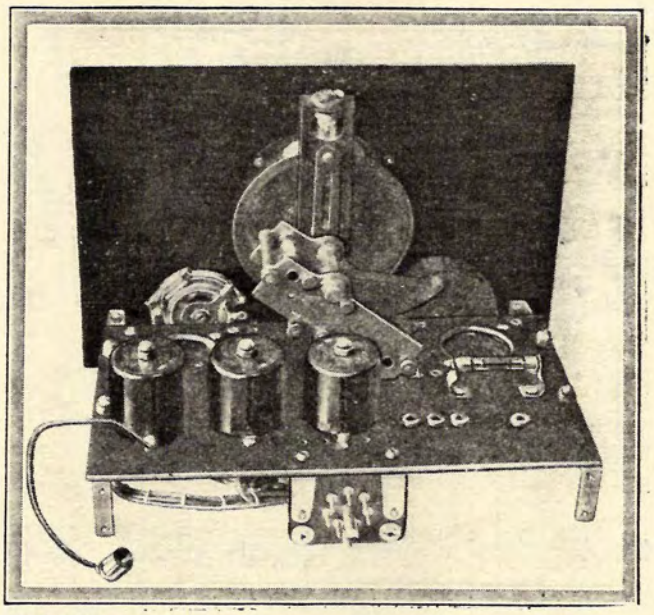
PANEL = 7"x14".
BASE = 7"x13"x5/8".
NAT'L. "B" DIALS.

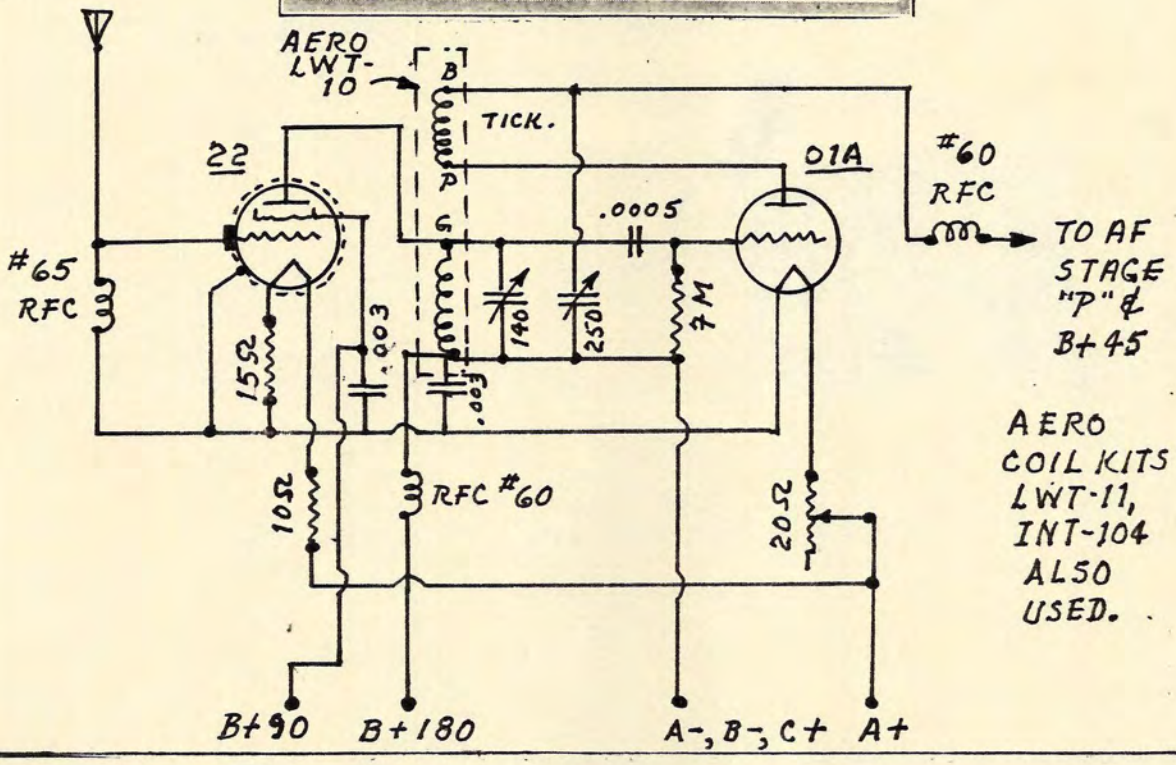
($33.00)



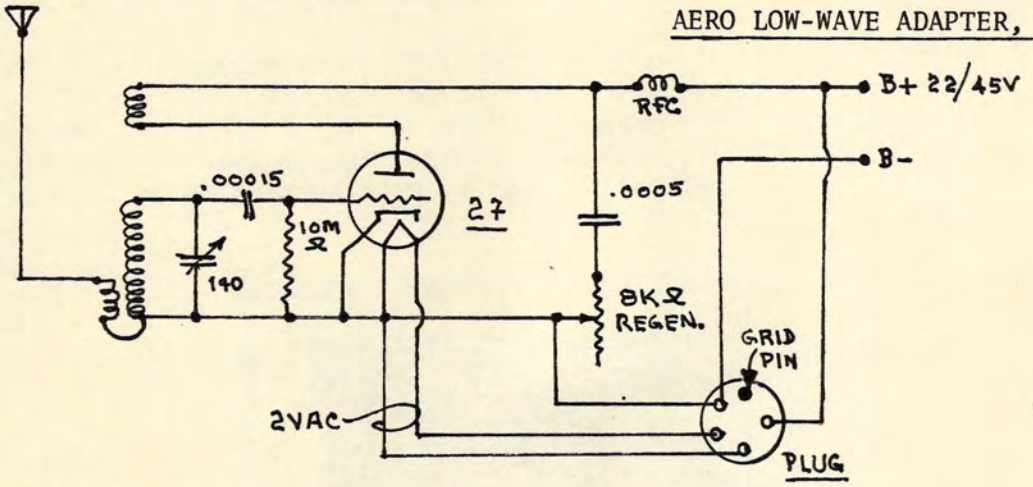
AERO 2-TUBE SHORT-WAVE CONVERTER, 1928

NOTE: This circuit is identical to the AERO SW receiver designated Aero International Four, depicted on page 9, up to where the detector feeds through an RFC into the first AF transformer. It was intended primarily to feed SW signals into the audio stages of a conventional receiver. Construction details are obvious, and the placement of parts is not too critical.



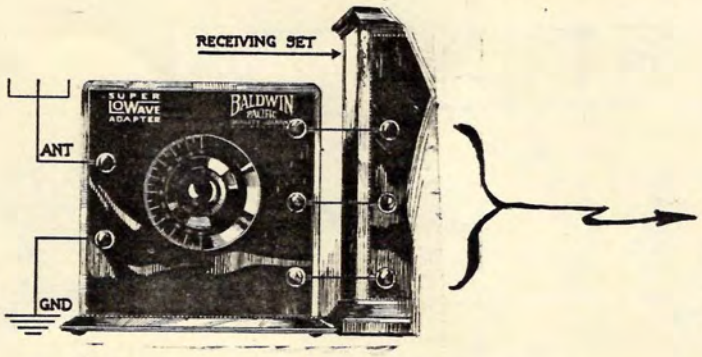


AERO LOW-WAVE ADAPTER, '28



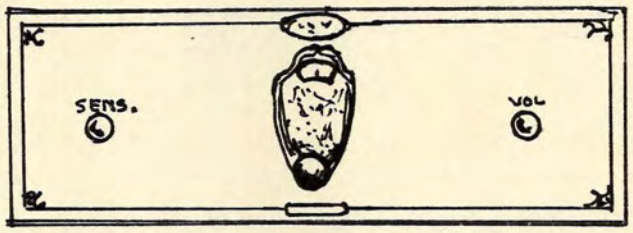
NOTES: 1. Use of 27 tube is not mandatory.
2. With an A.C. set, plug may also be inserted in 1st RF socket. Remove DET tube from receiver and place in unit.
4. Panel was 6" x 9" x 3/16th.

BALDWIN-PACIFIC LOW-WAVE ADAPTER, '26



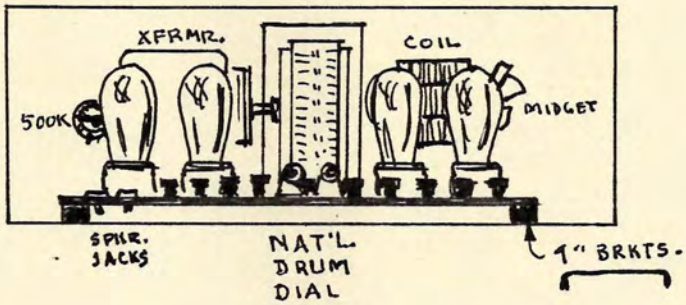
NOTES: 1. Covered 50 to 125 meters.
2. Golden Oak cabinet with Bakelite inletted panel.

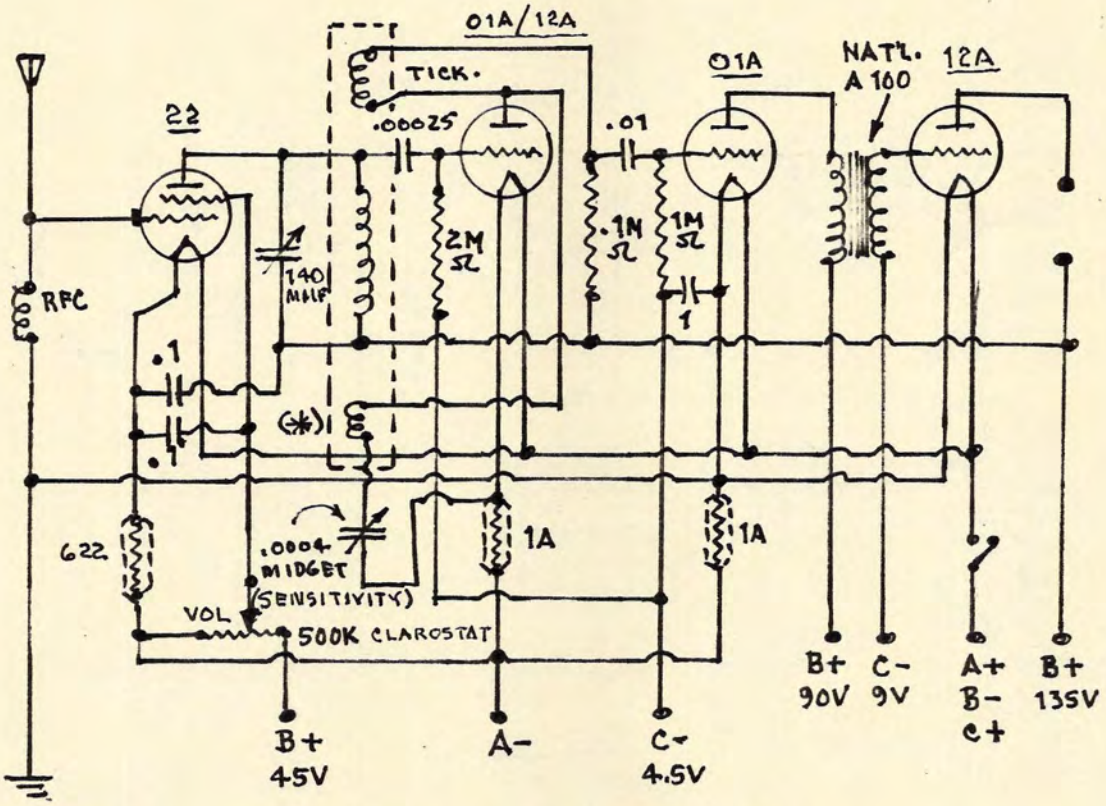
AIR-KING DeLUXE SW. RECEIVER, 1928



AIR-KING
SW COILS
(18-130M)
(3 WINDINGS)

7"x18" PANEL
4½"x14" SUB-PANEL
9 BINDING POSTS

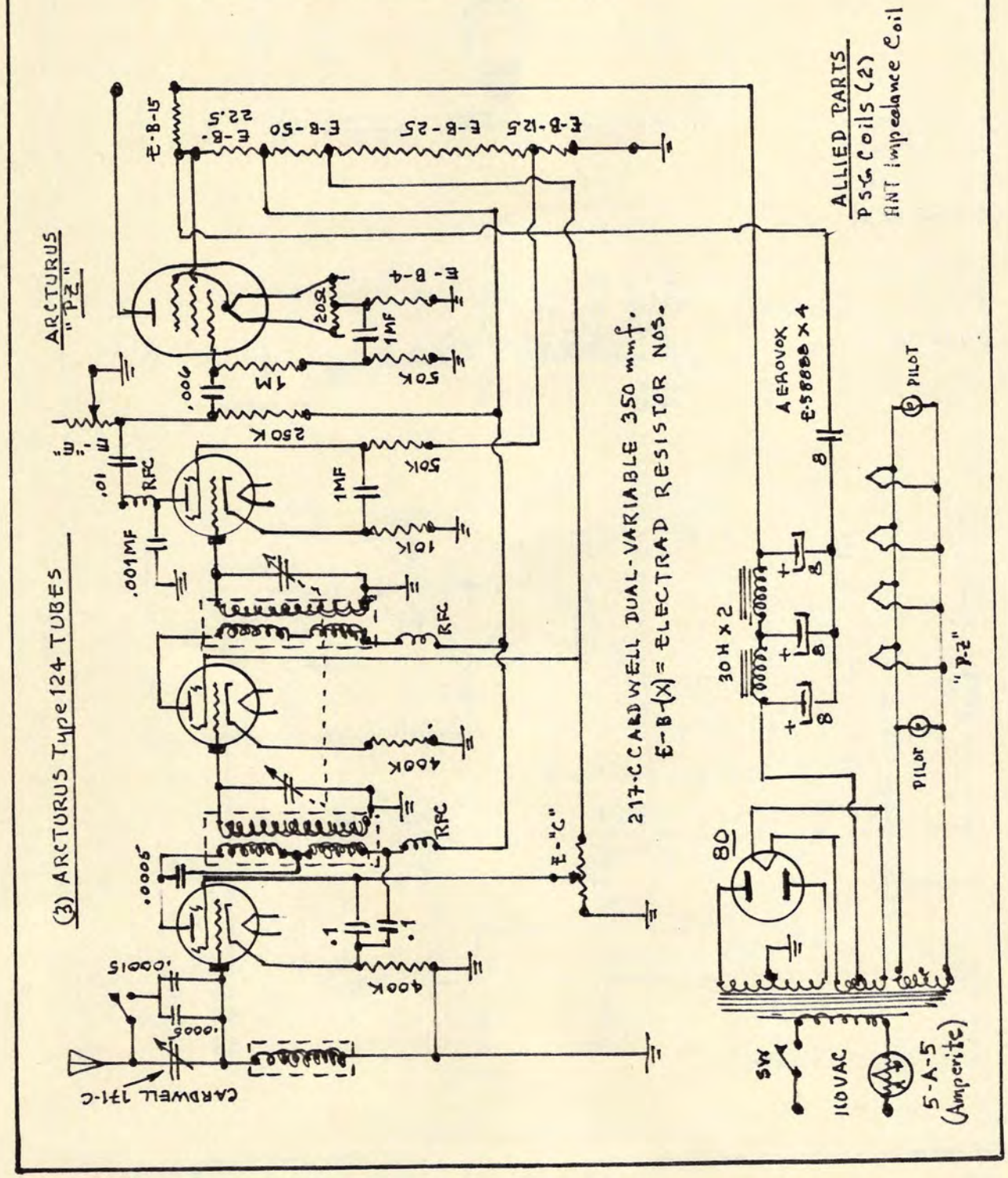




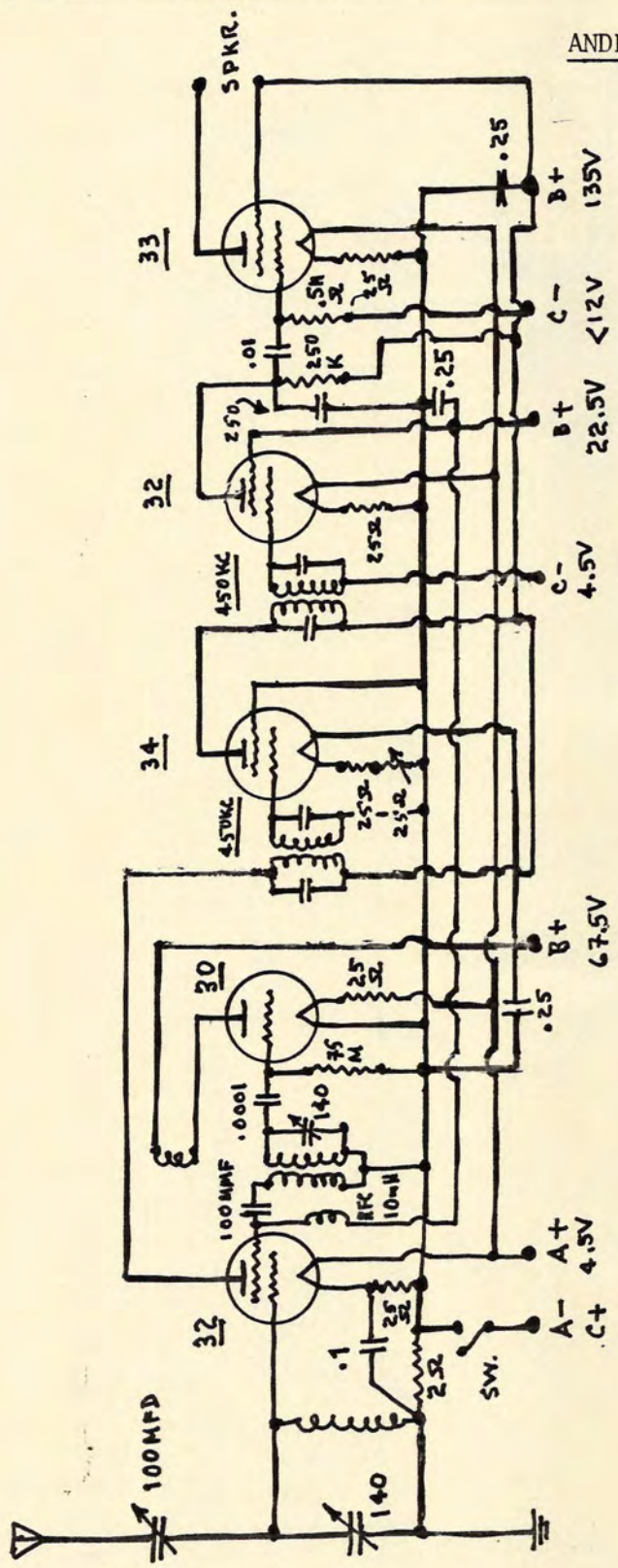
(RW 11-10-28)

(*) = Auxiliary Tickler

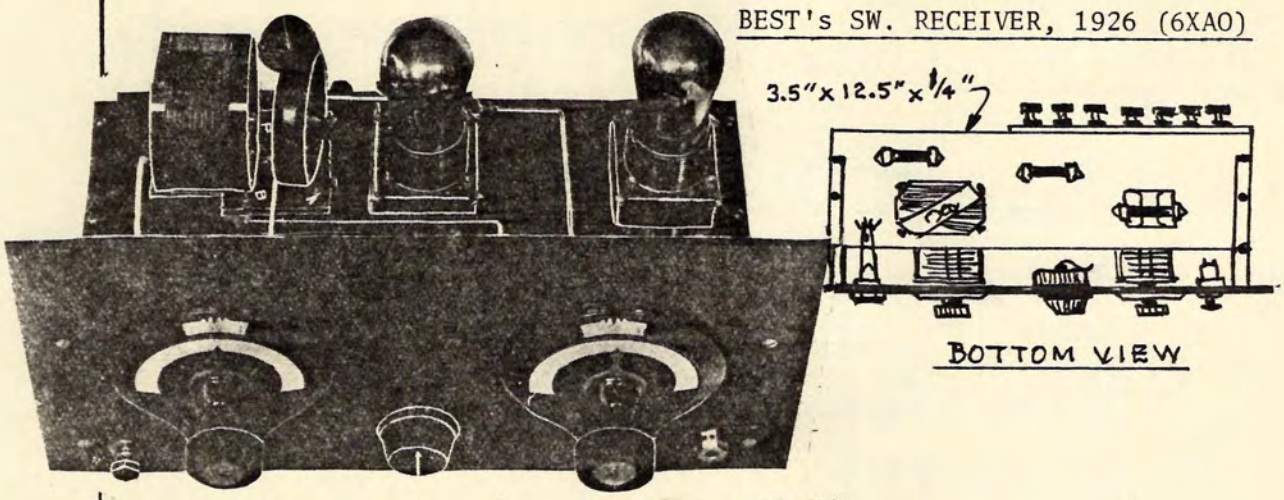
ALLIED ENGINEERING INSTITUTE's "FIND-ALL-FOUR" w/ PENTODES, 1930. (See also Cisin's original "Find-All-Four" receivers; two versions in II-A volume. The circuit was also adopted by Silver-Marshall as their "Round-The-World-Four", q.v.)



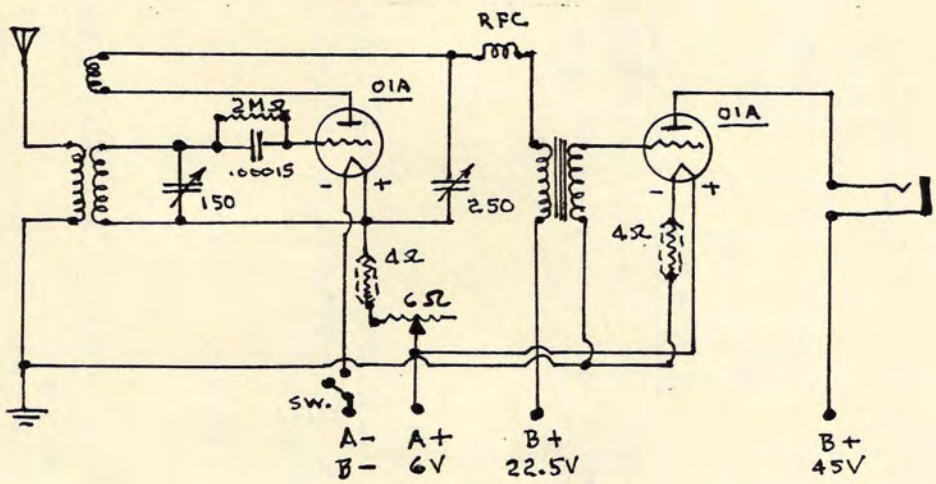
ANDERSON SHORT-WAVE RECEIVER, 1927



1. OSC. COIL HAS 3 WINDINGS; 6 PRONGS: OTHER 4 COILS HAVE 4 PRONGS.
2. 25Ω RESISTORS = BALLAST; 25Ω RHEOSTAT IN (-) LEG OF 34 TUBE.
3. CIRCUIT USES 0.5A CURRENT (FIL).
4. GRID-LEAK = 75MΩ.
5. IF XFRMRS. = 450KC, DOUBLE TUNED & SHIELDED.
6. COIL FORMS = 1.250"Ø.
7. ALL TUBES TAKE 2V ON FIL.
8. 75MΩ = ORIGINAL COLOUR CODE = VIOLET BODY, ORANGE DOT, GREEN END.
   250MΩ = RED BODY, YELLOW DOT, GREEN END.
   0.5MΩ = GREEN BODY, YELLOW DOT, BLACK END.



BEST's SW. RECEIVER, 1926 (6XAO)



COIL DATA

	SEC	TICK.
10-30 M	3T	2T
25-50 M	6T	3T
45-100 M	15T	6T
75-200 M	30T	9T

B-T Variable Condensers.
B-T AF Transformer.
B-T Inductances with Fixed PRI.
(7) Binding Posts.
P-P FIL switch.

(R 4-26)

RFC = 50T Honeycomb (or) 100T 1½" Ø Form.

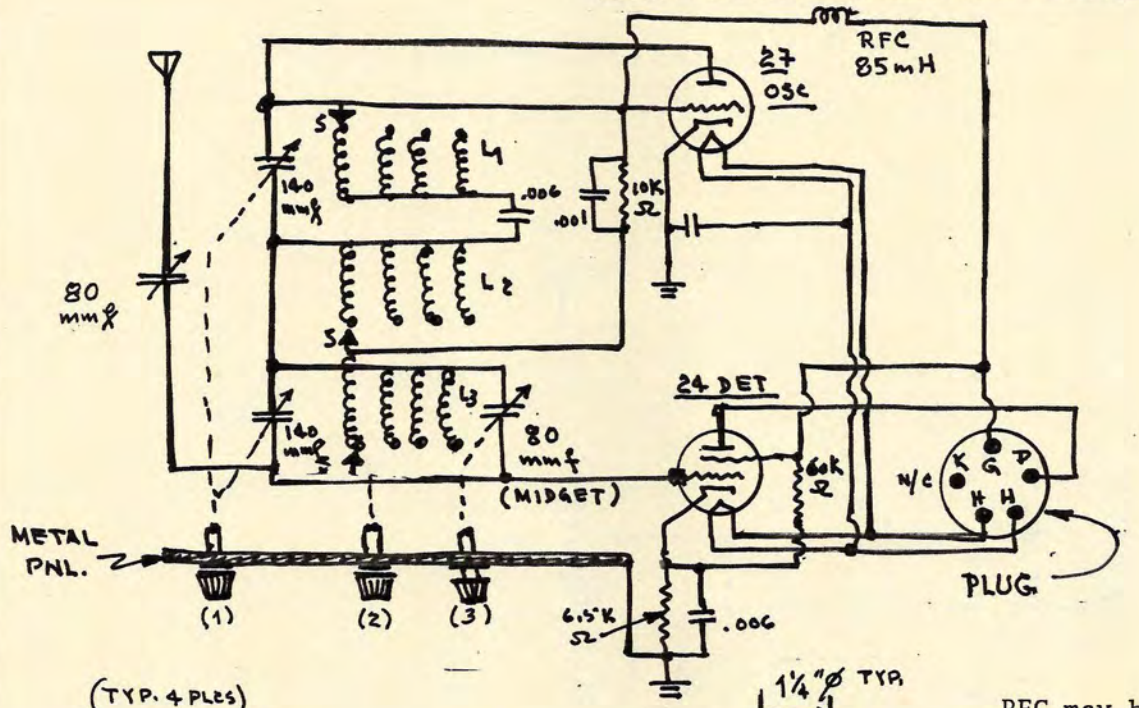
SEC COIL = #18 Bare Copper
TICKLER = #28 SSC.

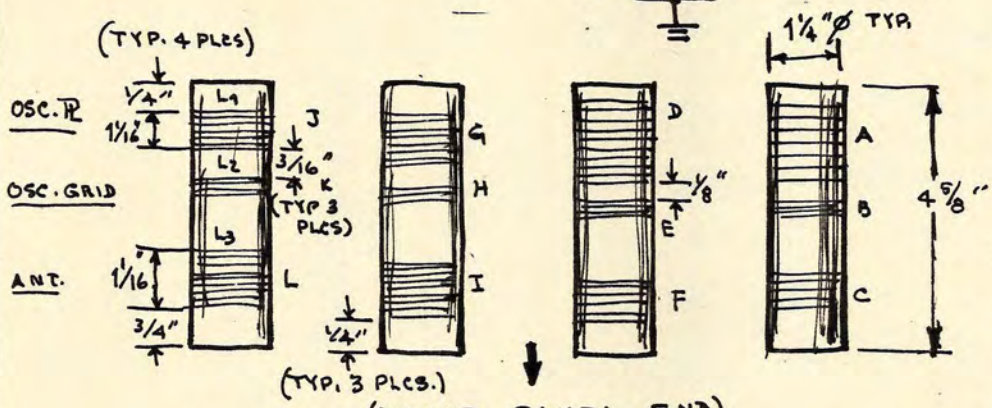
Wound on same form with ¼" separation.

75-100 M COIL = #26 SSC.

ANT COIL = 10T, #26 SSC, on 2.5" x .75" form.

BEST's SW. CONVERTER, 1929: 10-200 Mtrs





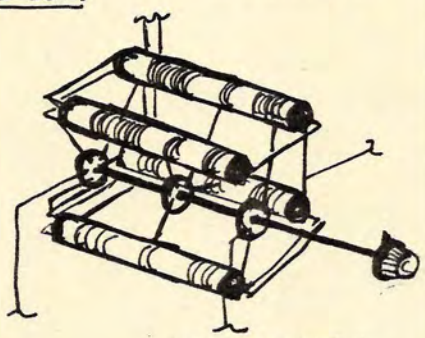
RFC may be 100 T, #29 D.S.C., on a 7/8" dowel.

6"x7"x10" Al. Shield-Box.

Nat'l. "Baby Vernier" Dials

OSC grid-coil is untuned.

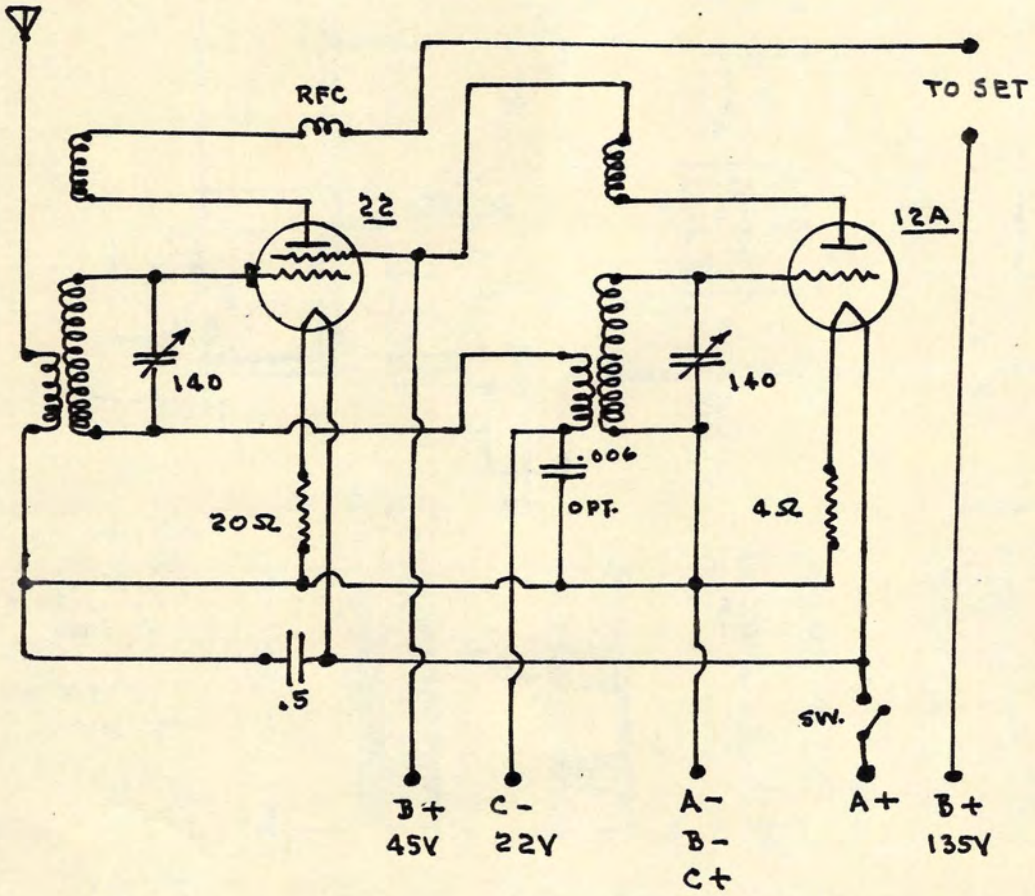
A = #16 Enamelled, 5T, 3/32" spacing.
B = #28 D.S.C., 5T, Close-Wound.
C = #16 Enamelled, 4T, 3/32" Spacing.
D = #16 Enamelled, 13T, 1/16" Spacing.
E = #28 D.S.C., 8T, Close-Wound.
F = #16 Enamelled, 10T, Spaced.
G = #20 Enamelled, 18T.
H = #28 D.S.C., 11T, Close-Wound.
I = #20 Enamelled, 14T, Spaced.
J = #26 Enamelled, 36T, Spaced.
K = #28 D.S.C., 22T, Close-Wound.
L = #26 Enamelled, 33T, Spaced.



COIL ASSY.
(Partial View)

(SWM,p.141)

BERNARD SW. MIXER, 1928



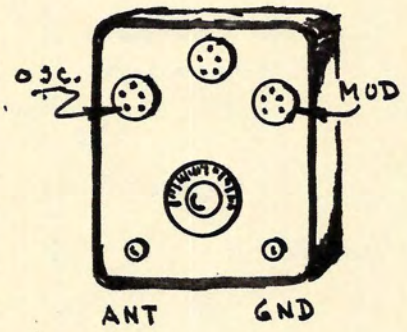
2 Sets of Commercial Coils Required.

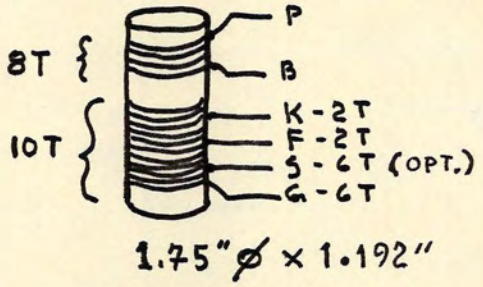
Panel = 7" x 10" x 3/16".

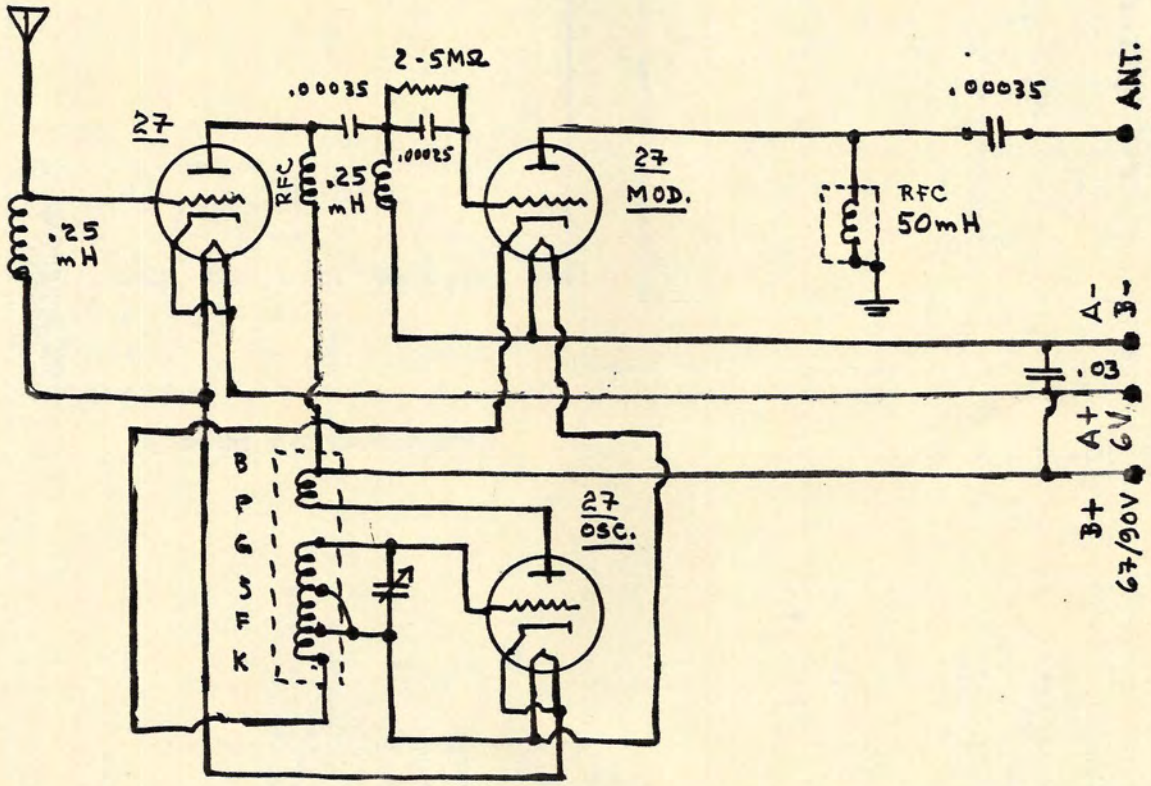
Sub-Panel = 7" x 9" x ½".

(RW-7-'28)

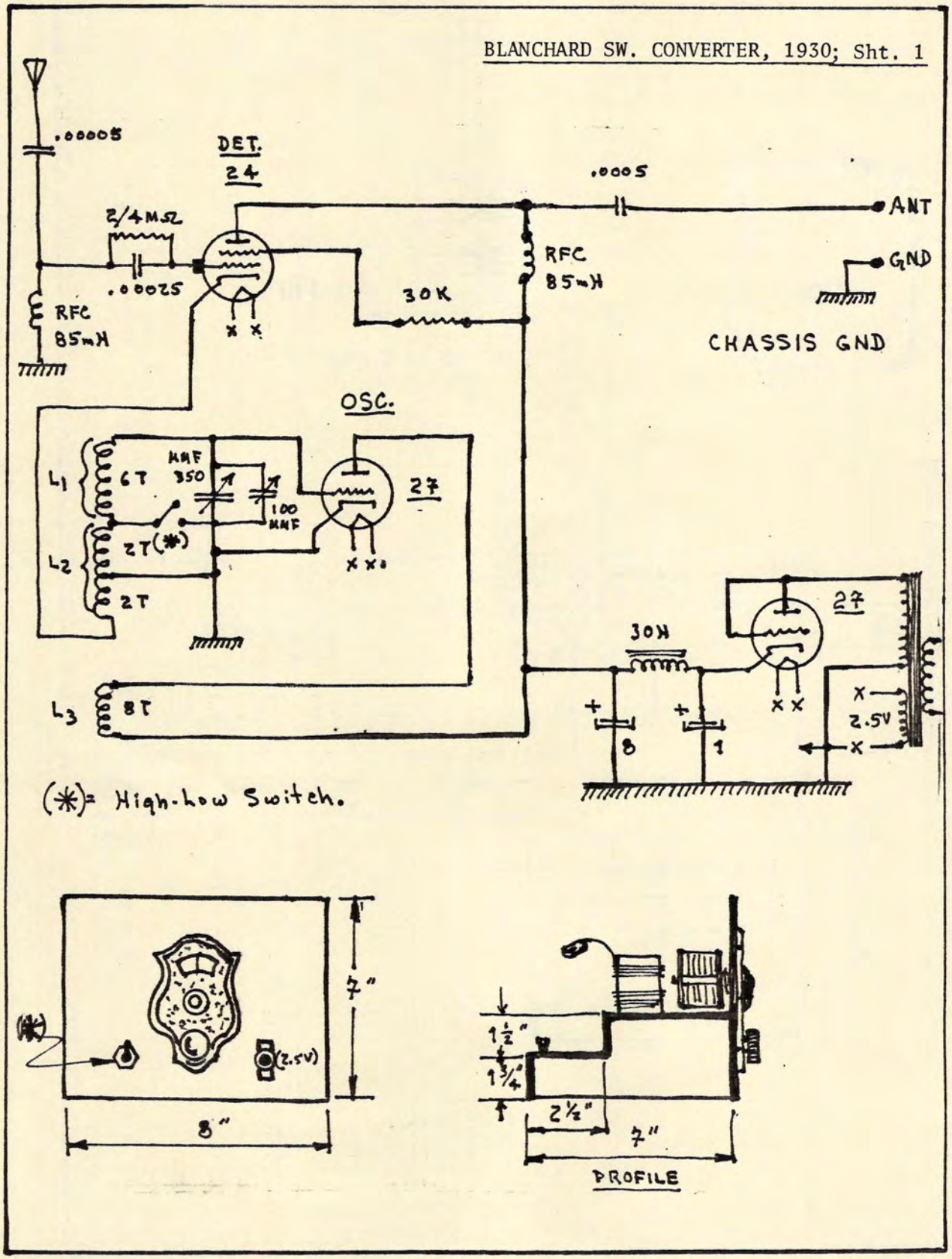
BERNARD SW. CONVERTER, 1930







BLANCHARD SW. CONVERTER, 1930; Sht. 1



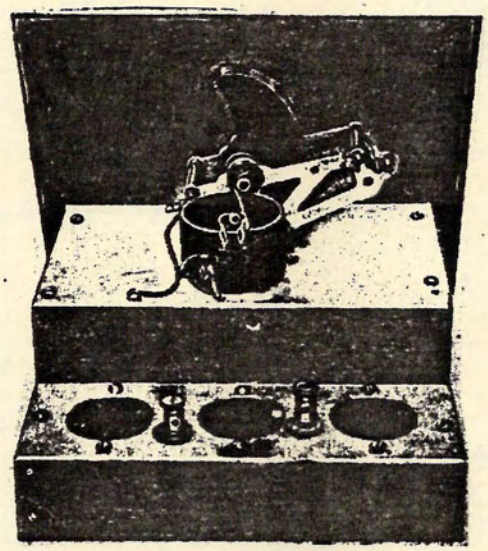
BLANCHARD SW. CONVERTER, 1930; Sht.2

Earlier model employed a "Pilot" dial. Designed for use with screen-grid TRF's; receiver dial should be set around 230 meters.

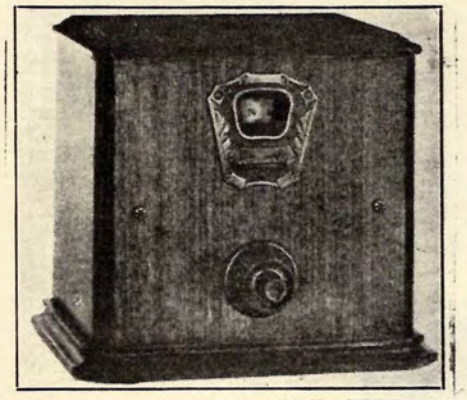
COIL DATA

Form = 1.75" Ø; #28 Enamelled Wire.

L1 & L2 = 10 Turns, Tapt @ 6T & 8T.
L3 = 8T, wound on same form, placed .250" from end of L1- not as shown on schematic.



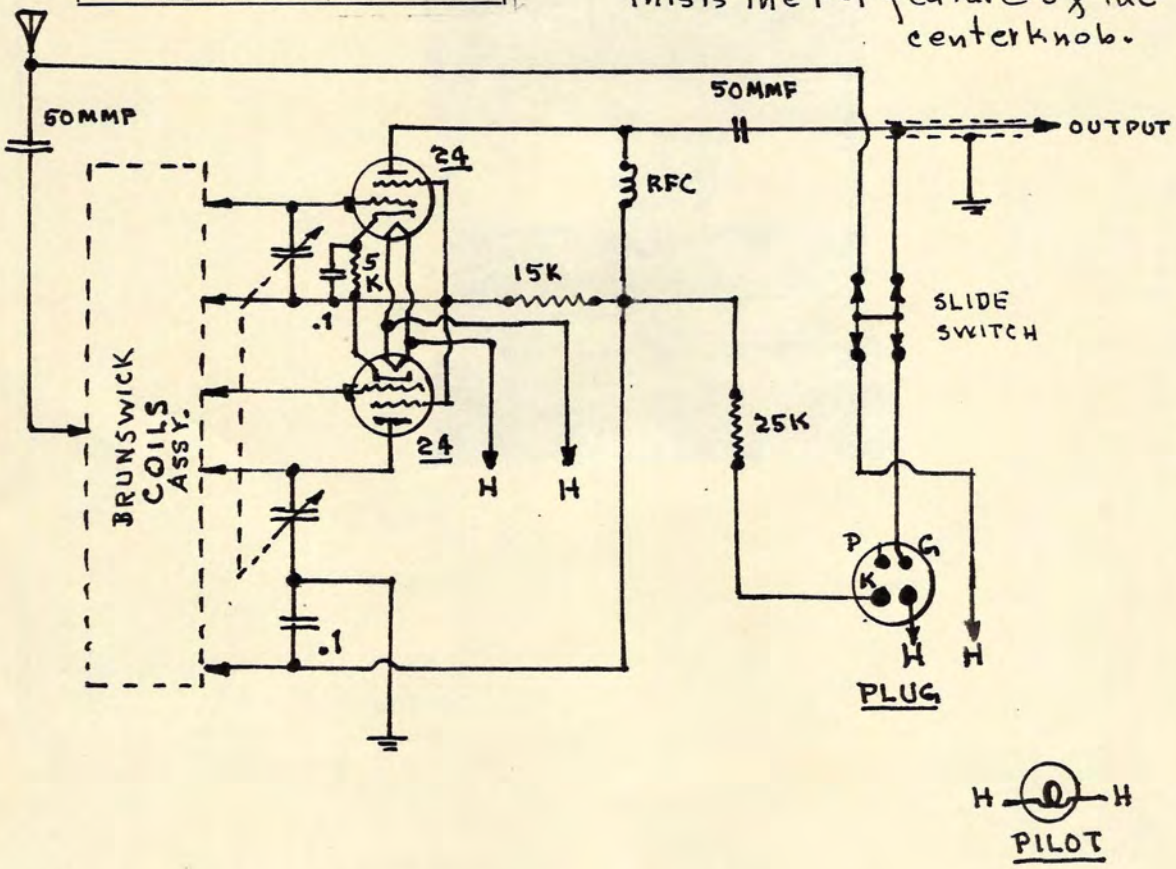
BRUNSWICK SW. CONVERTER, Model 100
(1932)



A Frequency-Changer Type.
I.F. = 600 ~ 800 KC.

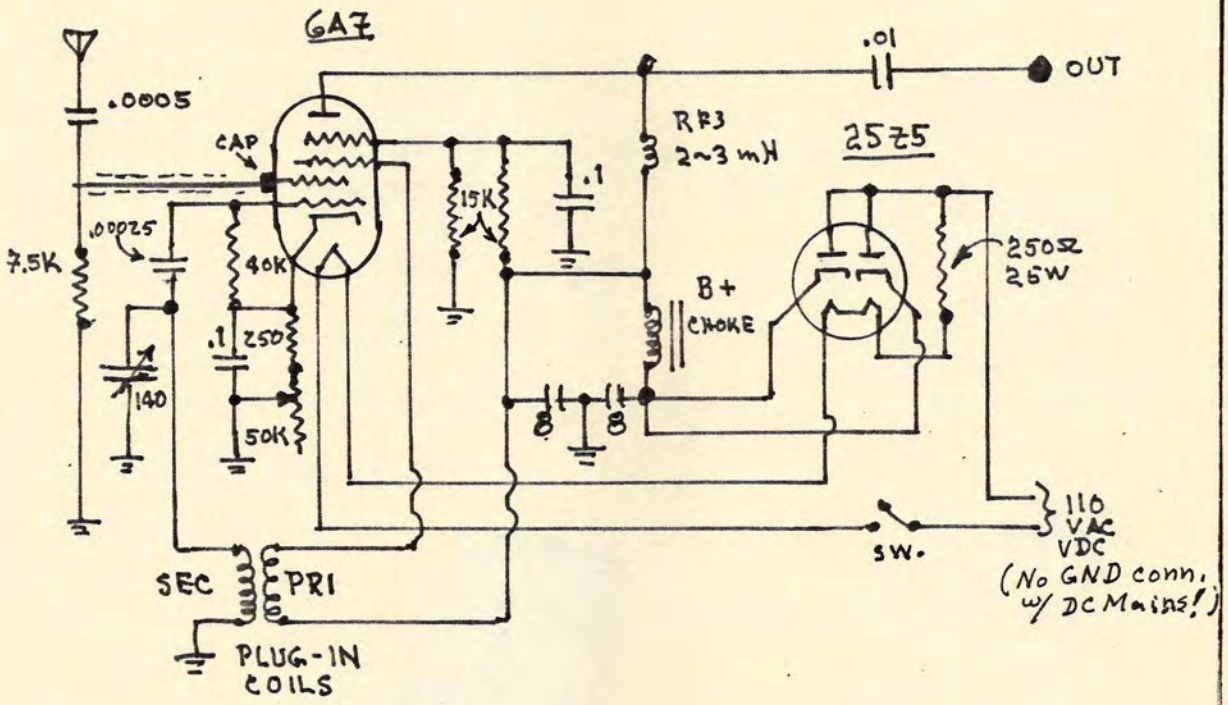
COILS
Black = 20 ~ 36 Meters.
Red = 37 - 60 "
Green = 120 - 200 "

Band-switching switch contains the FIL sw. & ANT change-over sw. This is the P-P feature of the center knob.



(RW 2-11-33)

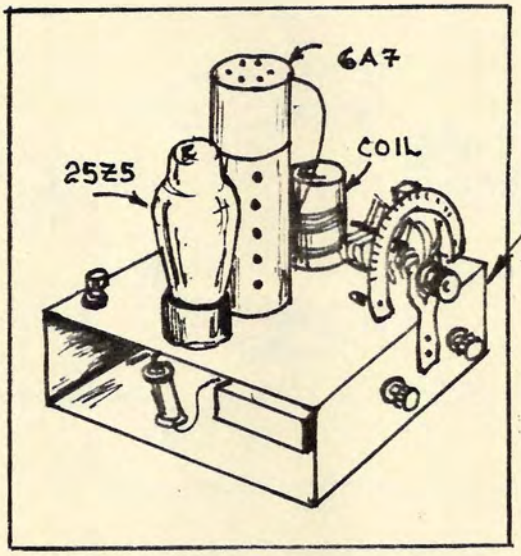
BAIRD SW. CONVERTER, 1933



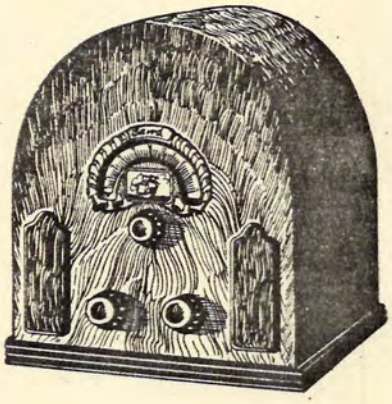
If oscillation does not occur, reverse connexions at socket of 6A7 from SEC winding.

15-200 Meters.

Walnut-Finish Cabinet - 8½W x 7"D x 11"H.

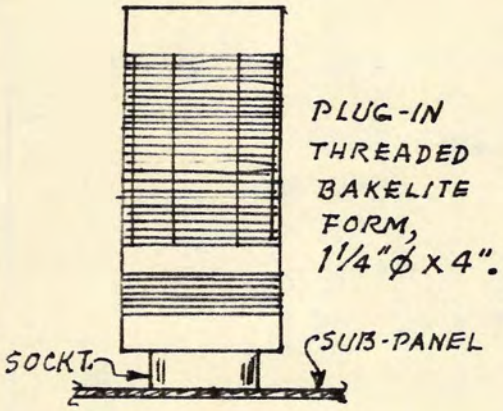


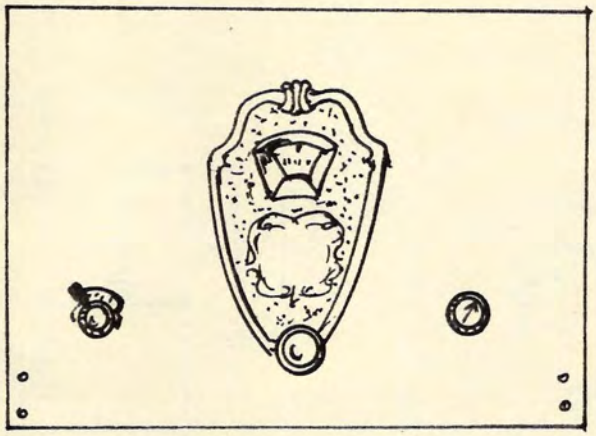
Chassis
BUD-TYPE
8½"x6¾"x3¼"



(RW 11-4-33)

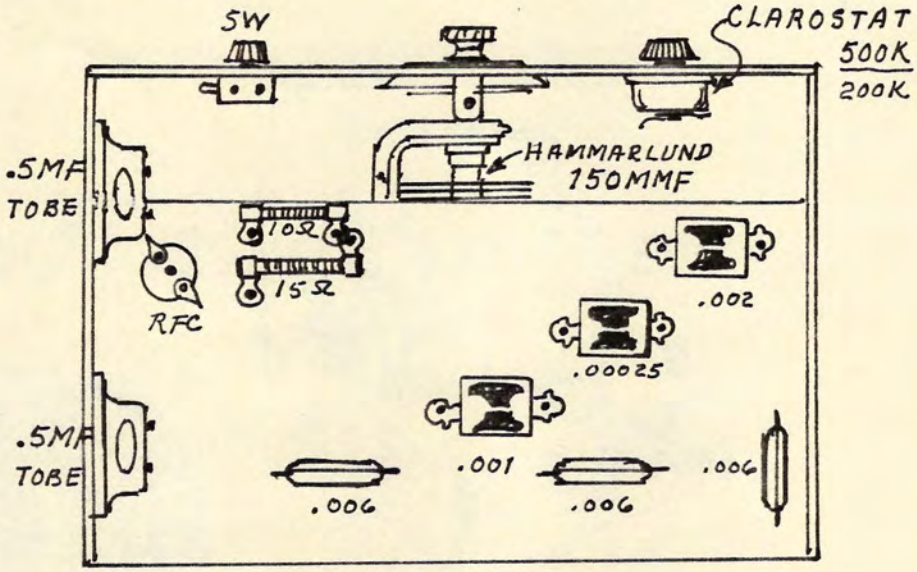
BRAXTON-KING SW RECEIVER,1929:Sht.1



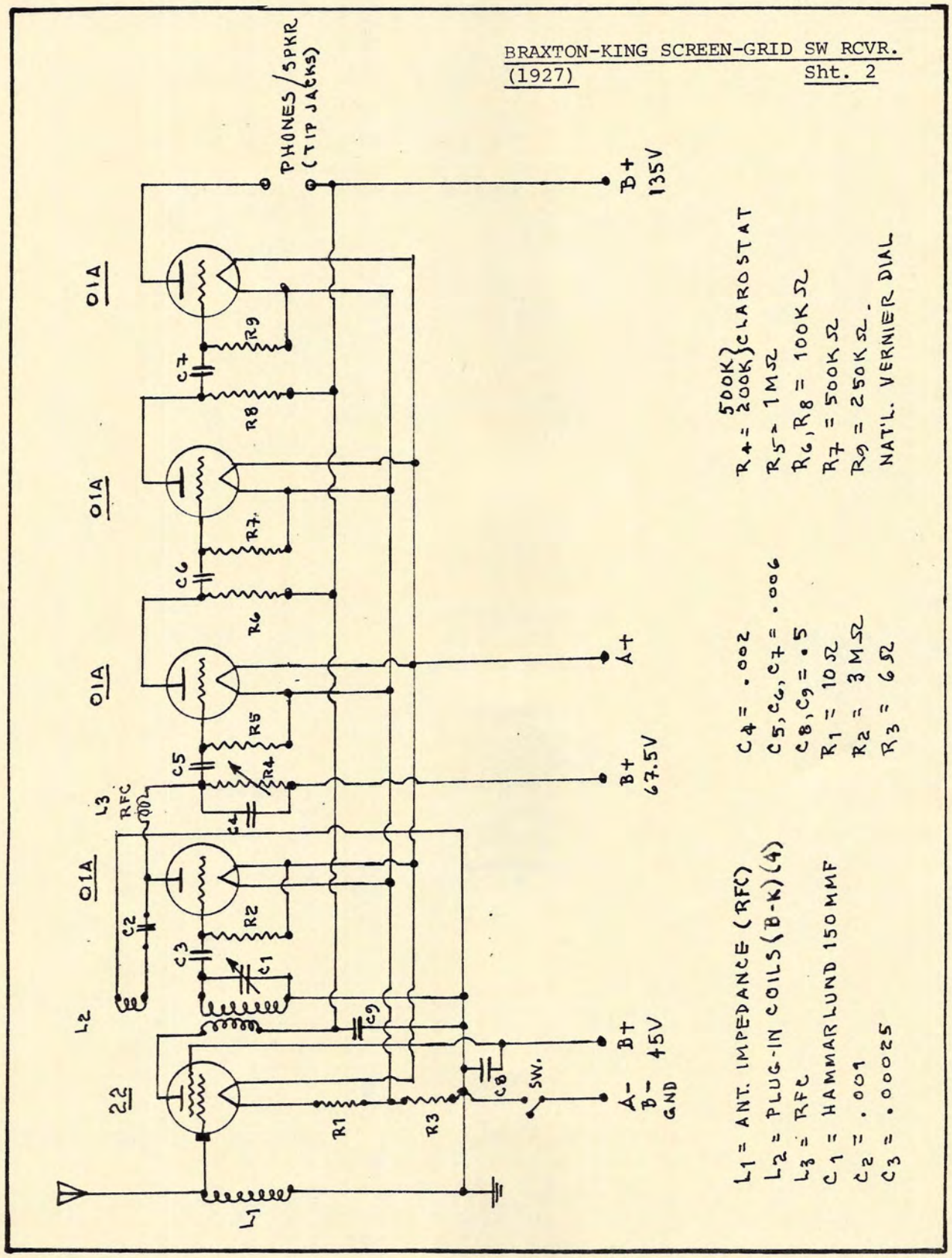


PANEL DETAILS, 7"x8½"

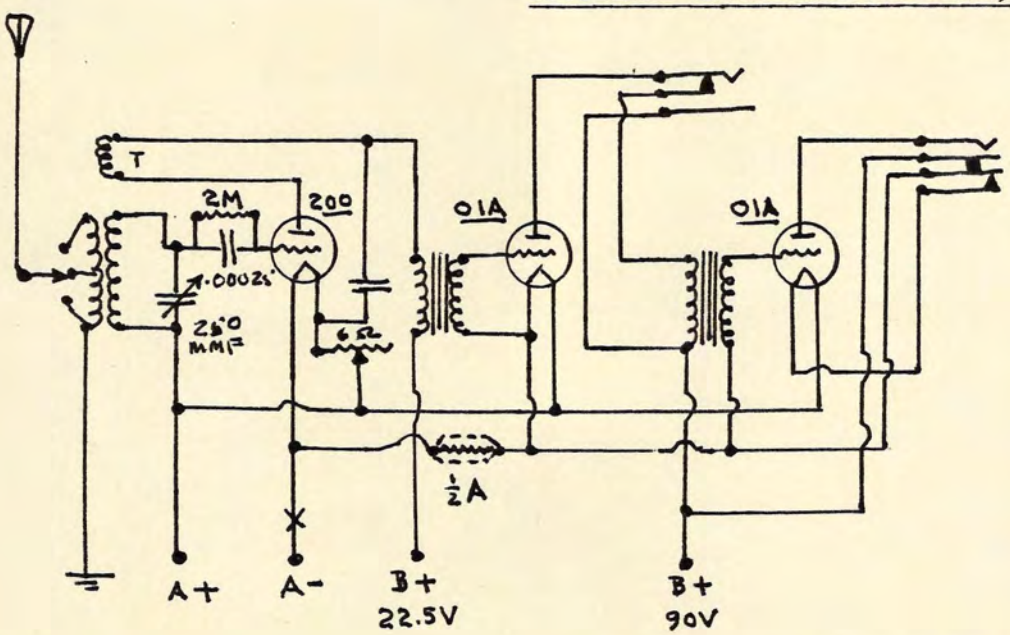
B-K COILS
RATIO 1:1
PRI = #30 DSC.
SEC = #19 ENAM.
SPACE-WOUND.
TICK. = SLOT-WOUND.
CPLNG. IS FIXED.

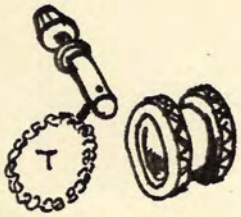


BOTTOM VIEW


BRAXTON-KING SCREEN-GRID SW RCVR.
(1927)
Sht. 2
PHONES/SPKR
(TIP JACKS)
B+
135V
01A
01A
01A
01A
22
R9
R8
R7
R6
R5
R4
R2
R1
R3
C7
C6
C5
C4
C3
C2
C1
C9
C8
L1
L2
L3
RFC
SW.
A+
B+
67.5V
A-
B+
B-
45V
GND
L1 = ANT. IMPEDANCE (RFC)
L2 = PLUG-IN COILS (B-K) (4)
L3 = RFC
C1 = HAMMARLUND 150 MMF
C2 = .001
C3 = .00025
C4 = .002
C5, C6, C7 = .006
C8, C9 = .5
R1 = 10 Ω
R2 = 3 MΩ
R3 = 6 Ω
R4 = 500K 200K CLAROSTAT
R5 = 1 MΩ
R6, R8 = 100K Ω
R7 = 500K Ω
R9 = 250K Ω.
NAT'L. VERNIER DIAL

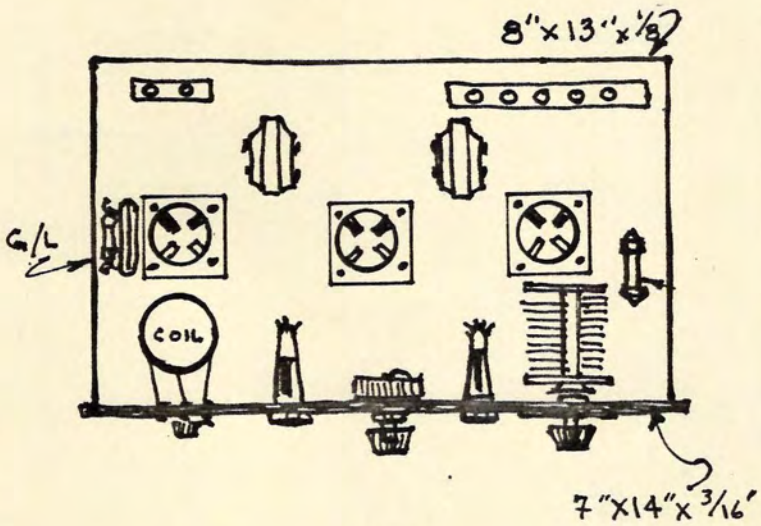
CITIZENS' SHORT-WAVE RECEIVER, 1926



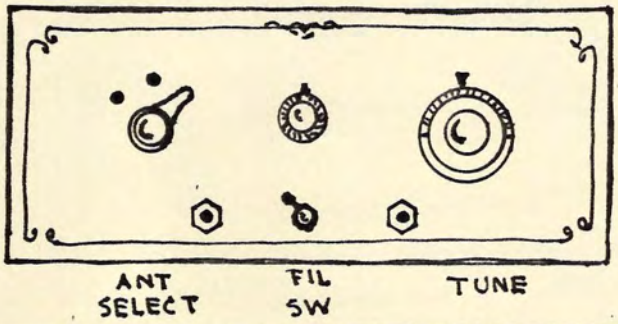


ORIGINAL COIL CONFIGURATION

AmeroTran AF Xfrmrs.
#3 & #4 Jacks.
#12 Buss-Bar (Wire).
Howard Tube Sckts.

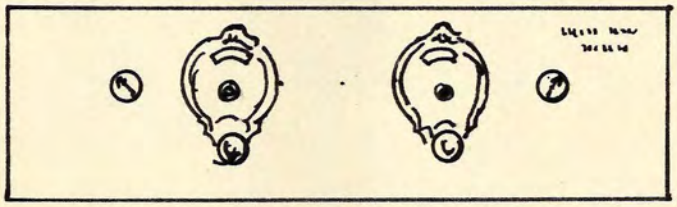


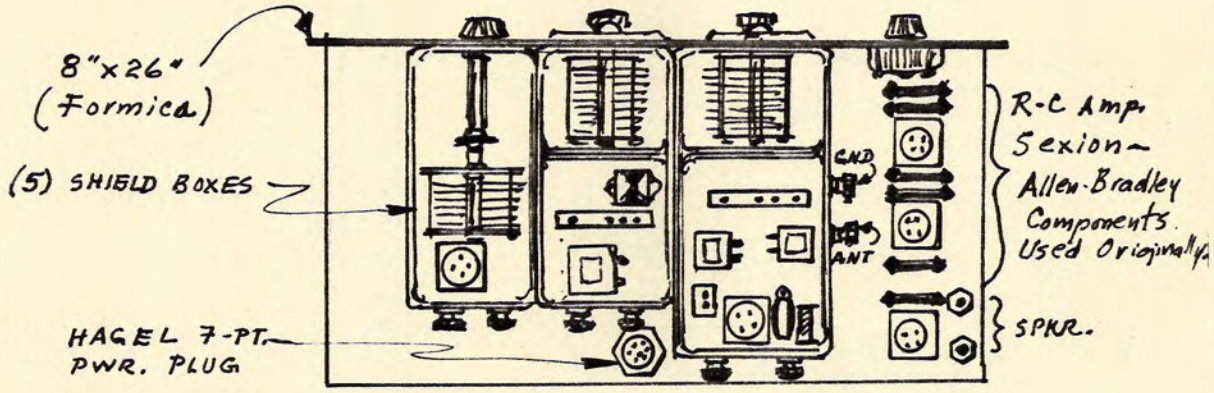
RHEO.



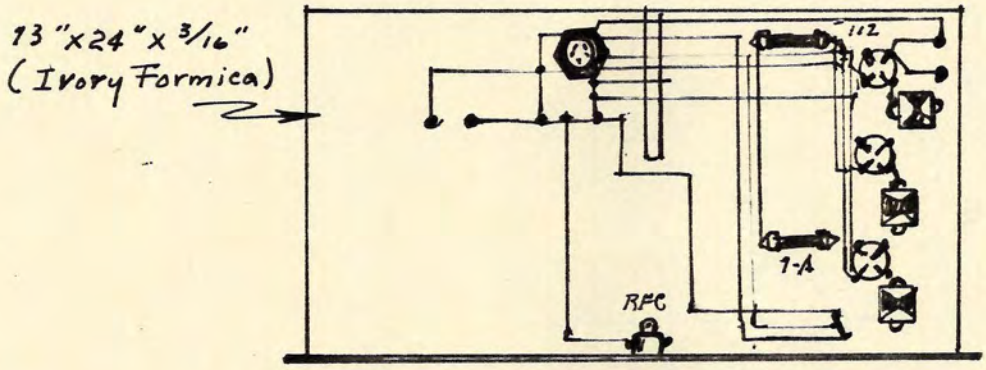
(CB Spring 26)

CITIZENS' S.G. SW. RECEIVER, 1928; Sht. 1





PLAN VIEW

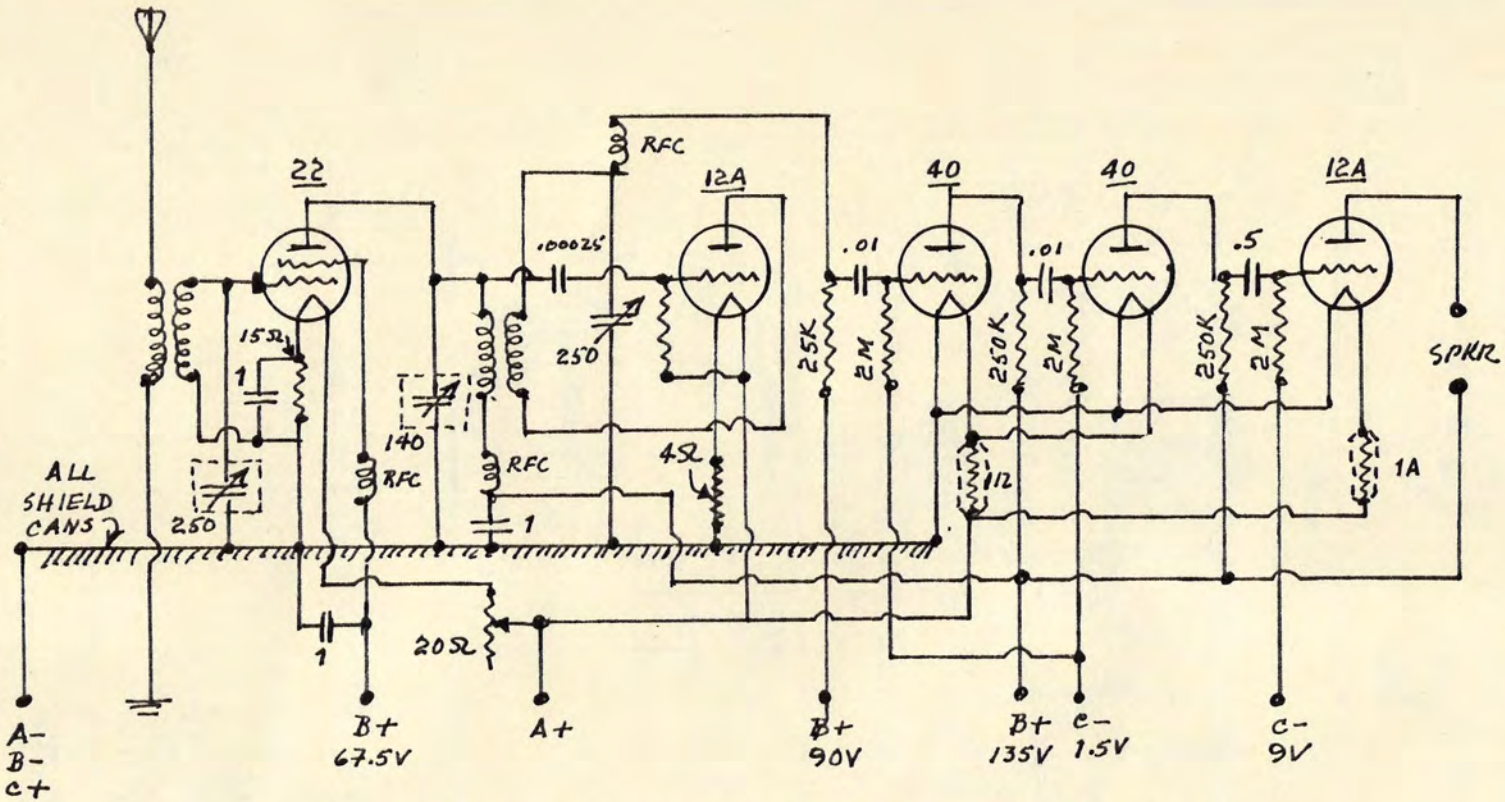


GENERAL LAYOUT of BOTTOM of SUB-PANEL

Principle Parts:

ALCOA Boxes: (2) 5"x6"x6¼"; (2) 5"x2¾"x6¼"; 9"x5"x6¼".
(3) REMLER RFC #35.
(2) NAT'L. "C" VERNIER DIALS.
(3) KARAS SUB-PANEL BRKTS.
(2) AMSCO 250mmf VARIABLE.
AMSCO 140 mmf VARIABLE.
AMPERITES 1-A & 112.

(CB 3-28)



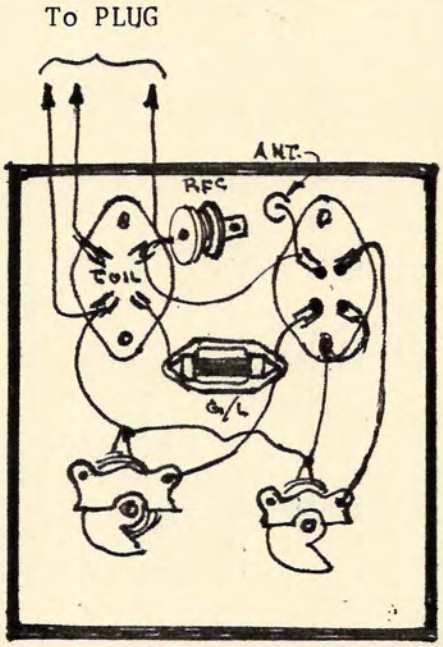
AERO PLUG-IN SW. COILS: №4; №5; 2040K; 4080K; 9018K.
(125M) (B.C.) (40M) (40M) (180M)

(a) 2 of each required to cover 20 to 550 meters.

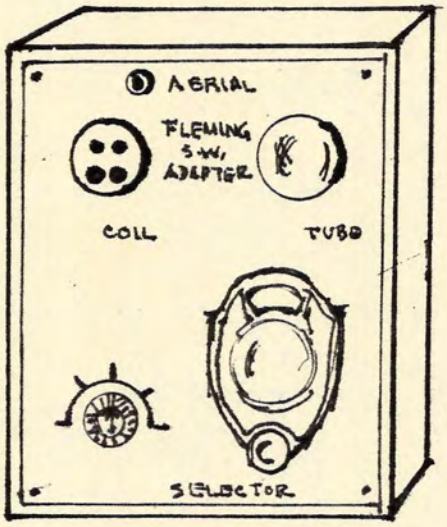
(b) Plug-in coils using the horizontal type mounting strip. (Other similar coils may be used - i.e., 2 windings types.)

CITIZENS' S.G. SW, RECEIVER, 1928: Sht.2

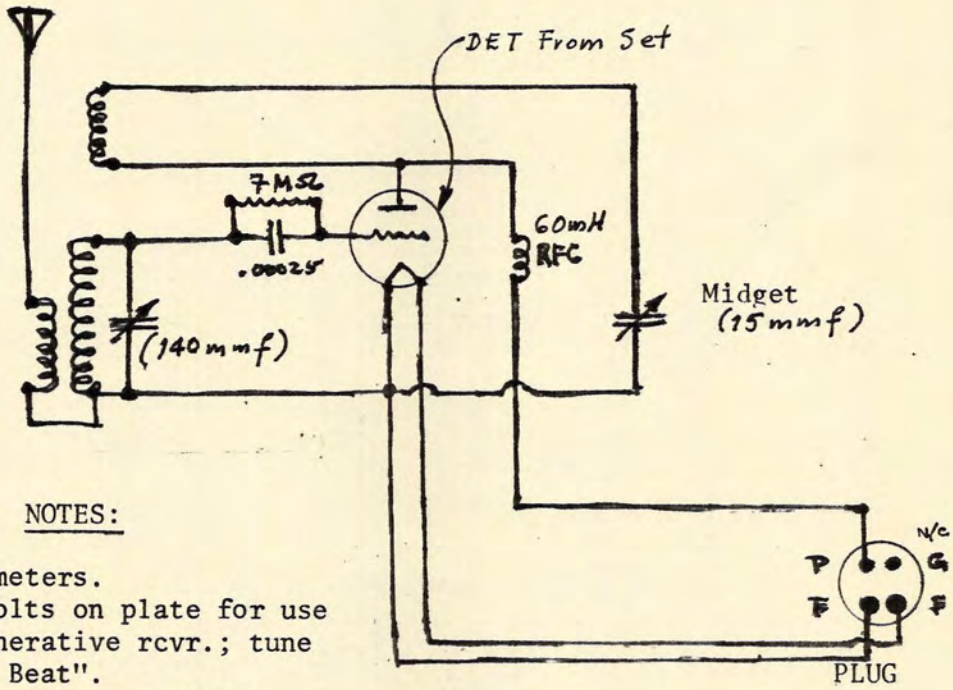
A-C DAYTON SW. CONVERTER, 1929



(5.5" x 7" x 2.75")



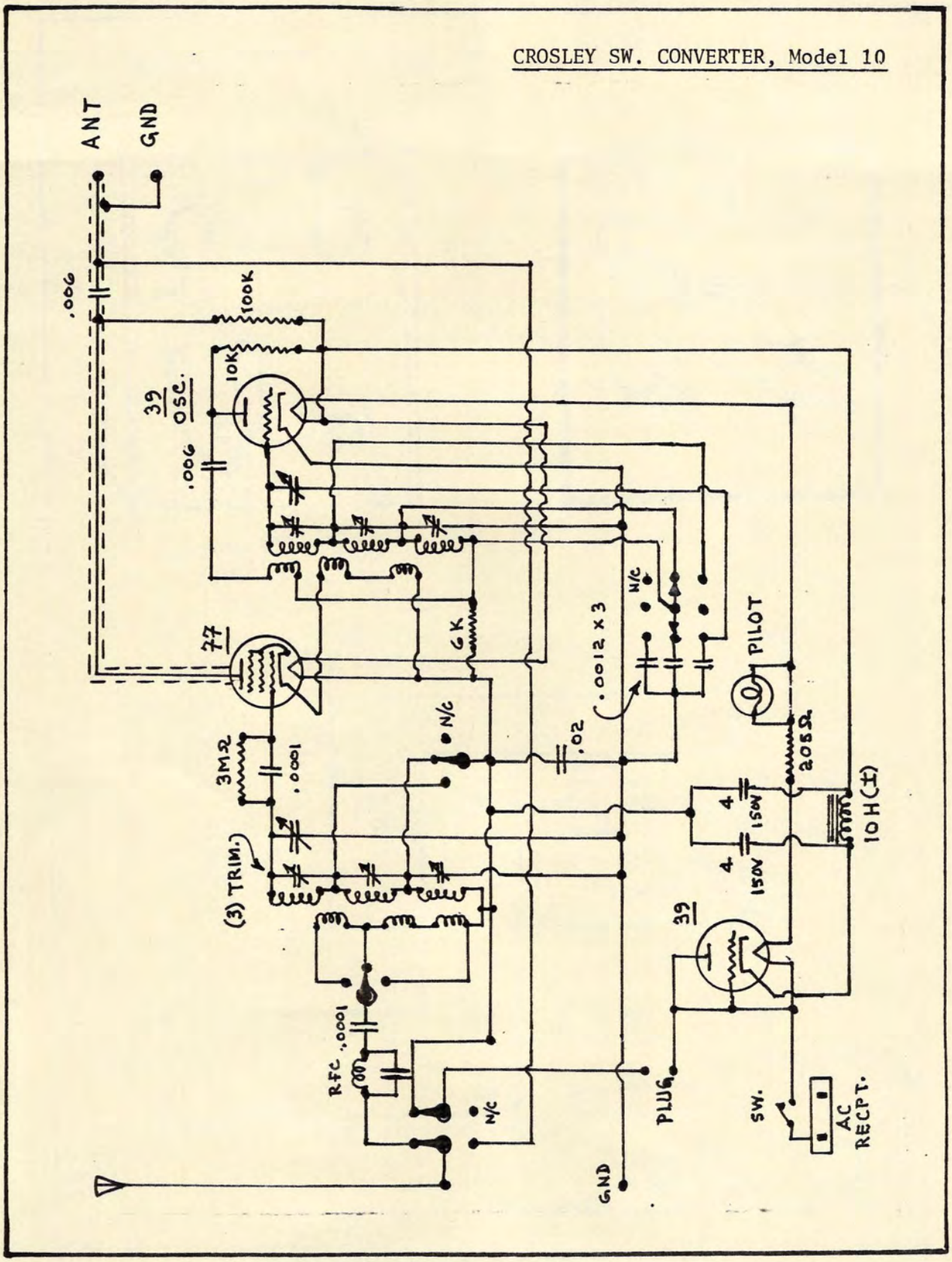
(See also Flewelling SW. converter.)



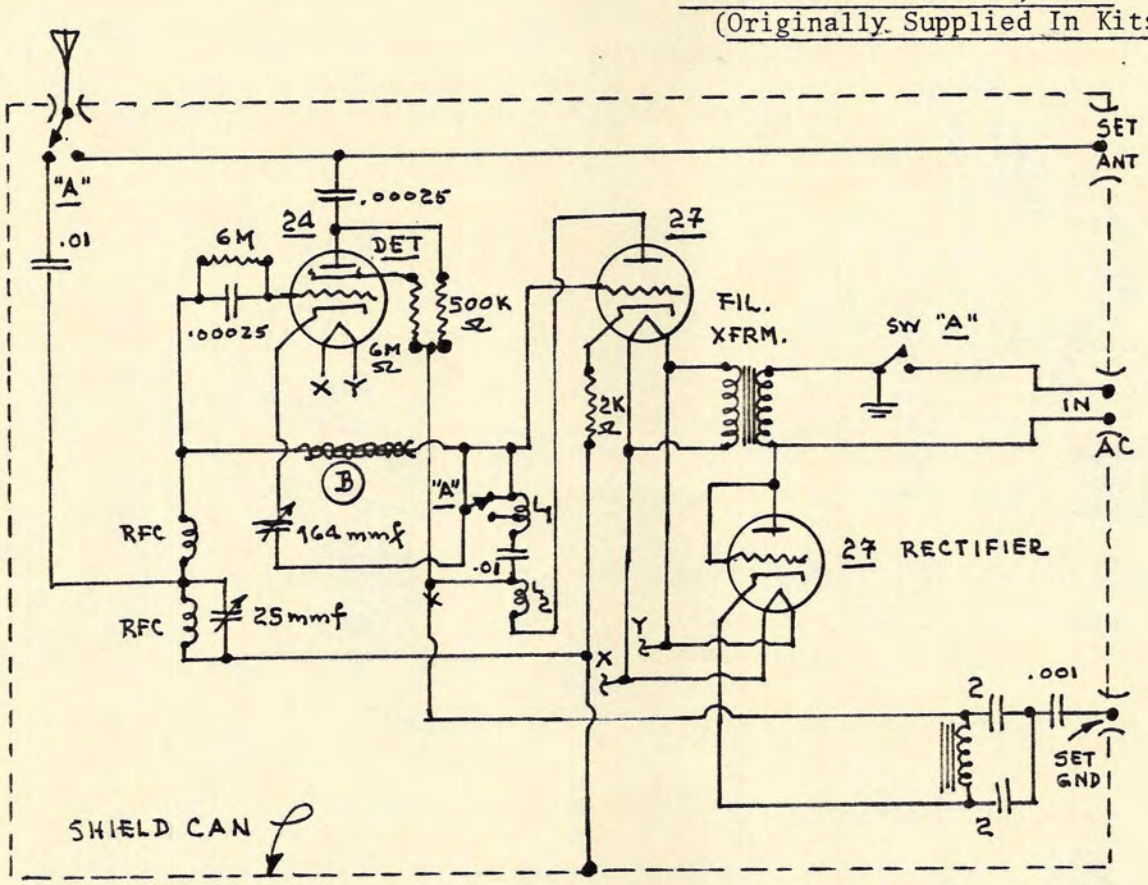
NOTES:

1. 17 to 84 meters.
2. 22.5/45 volts on plate for use with regenerative rcvr.; tune for "Zero Beat".
3. Otherwise, set rcvr. dials between 450 and 500 meters.
4. Tickler fixed and integral with bottom of coil socket.

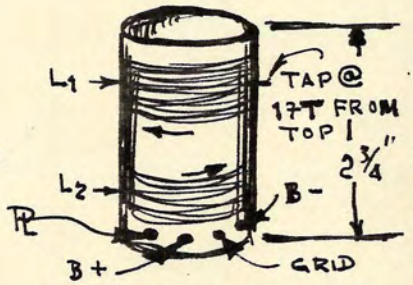
CROSLEY SW. CONVERTER, Model 10



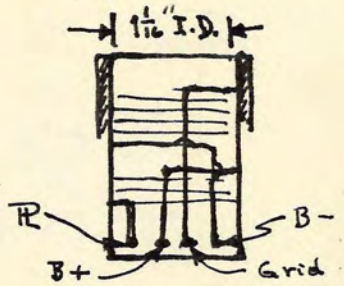
DETROLA SW. CONVERTER, 1933
(Originally Supplied In Kits)



OSCILLATOR COIL



INTERNAL CONNEXIONS



COIL DATA

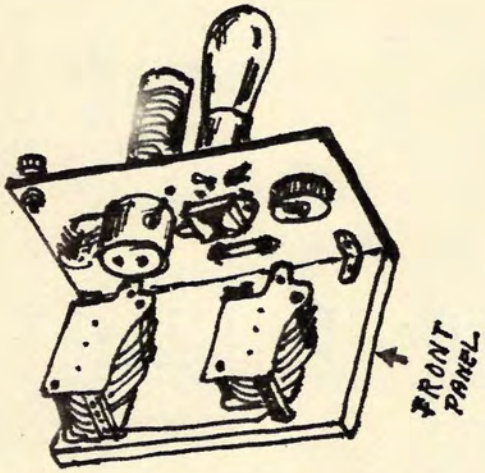
L1 = 26T, #28 SSC Form = 1.064"
L2 = 21T, #28 SSC Wound Opposite.

RFC 1 = 25T, #28 Enamelled
RFC 2 = 20T, #28 Enamelled

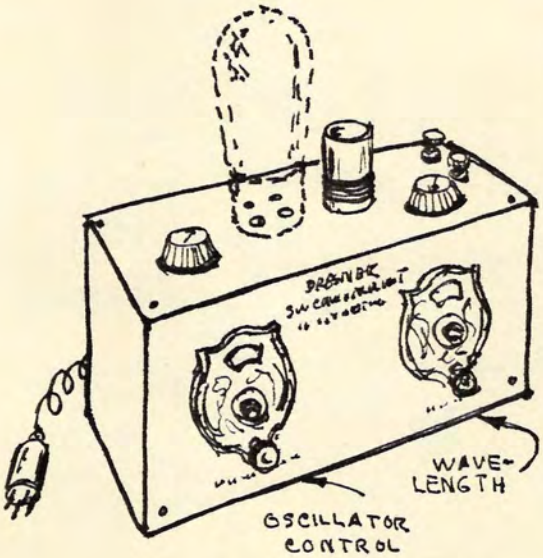
3 Switches marked "A" ganged.

(B) = Twisted wire represents oscillator coupler: length of twist to be determined by cut-&-try.

DRESNER SW. CONVERTER CONFIGURATIONS
(1st & 2nd Versions, 1927 - 1928)
15 to 550 Meters: 5 Interchangeable Coils.

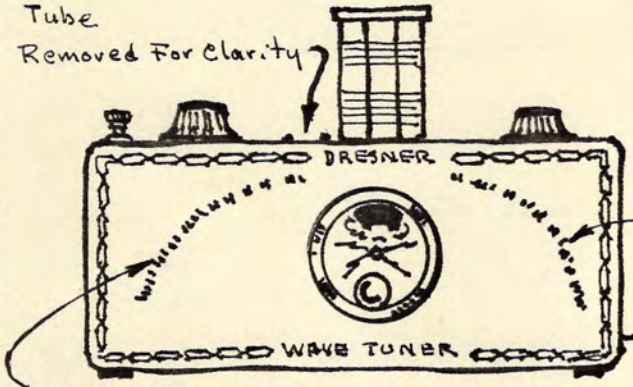


PARTIAL VIEW of DRESNER S.W. CONVERTER - 1927



FIRST VERSION
(1927 - 22.50)

Tube Removed For Clarity



LEGENDS
"Range 15 to 550 Meters"

Mahogany Metal Cabinet - Art-Deco Panel.

LEGEND:
"S-W Converter Unit"

2nd VERSION
(1928 - $16.50)

[AC-DC-BATTERIES]

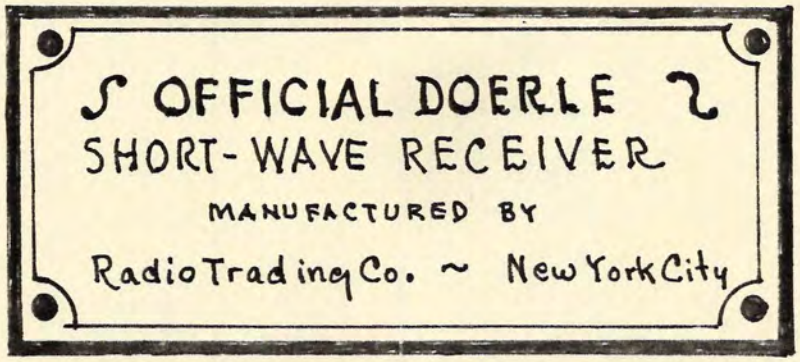
THE DOERLE SERIES

In the early Thirties one of the most popular short-wave kits was one offered by the Radio Trading Company, of New York City. It was picked at by its designer about every six months, similar to the restless design changes of Herman Bernard and his "Diamond of the Air" a few years earlier, and all such "pickings" were dutifully reported in media.

The circuit design was Doerle's, not the components, as he specified Gen-Win coils, Na-Ald coils, Hammarlund coils, as well as offering coil-winding data. The original model employed a plywood baseboard; subsequent models employed formed aluminum chassis.

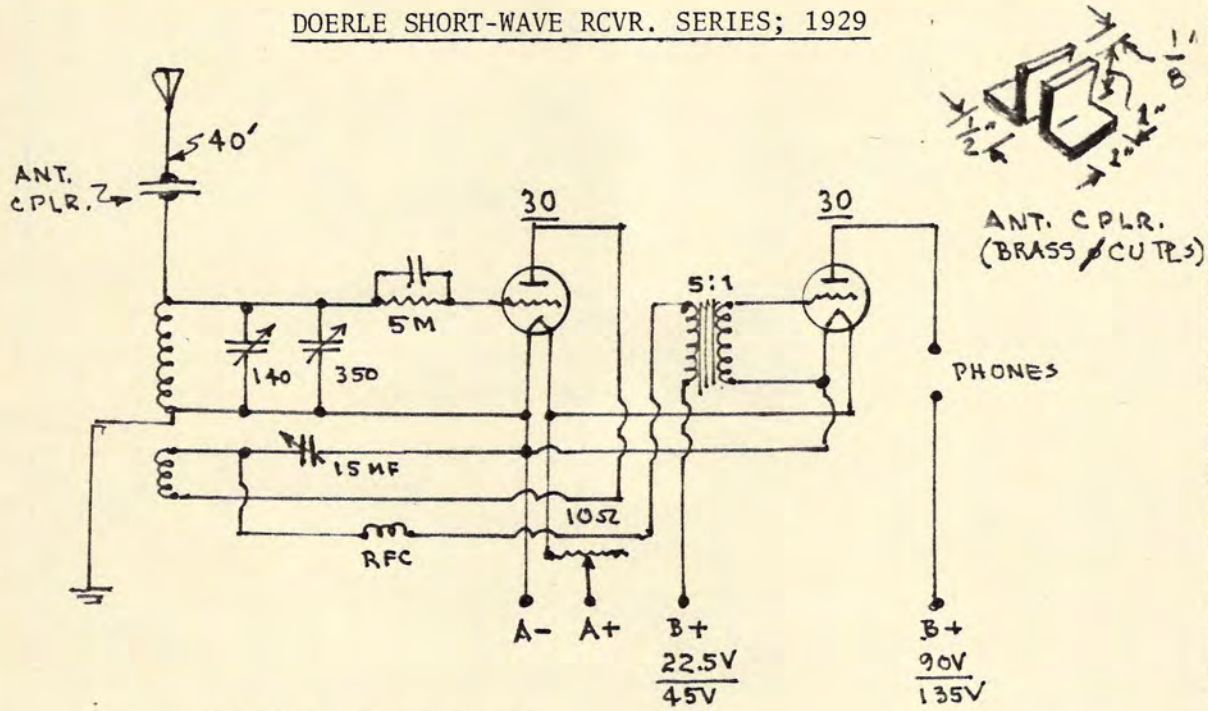
Various tubes were also played around with, and included the very fine 30, along with 37, 56, 57, 77,and 2A5; the sets being offered in both battery and A.C. versions. The averaged coverage was 15 to 200 meters, which was standard for the times.

Like "The Diamond of the Air", Doerle and Radio Trading tried to create a cult around the unit, offering brass "Official Doerle Short-Wave Reciver" tags to be affixed to your creation. Bernard had done the same thing earlier with his "Diamond", and so-called clubs were started. The set is easy to construct, and really works rather well.



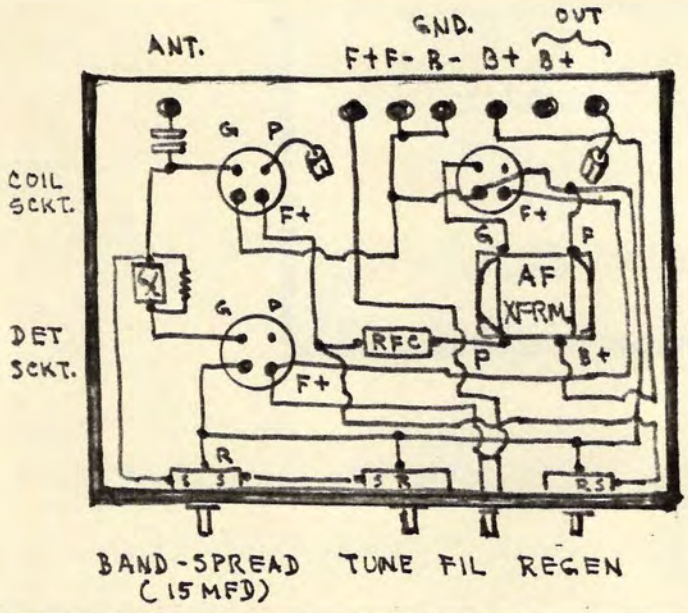
Facsimile of the "official" brass name-plate given to buyers of Doerle short-wave receivers.

DOERLE SHORT-WAVE RCVR. SERIES; 1929

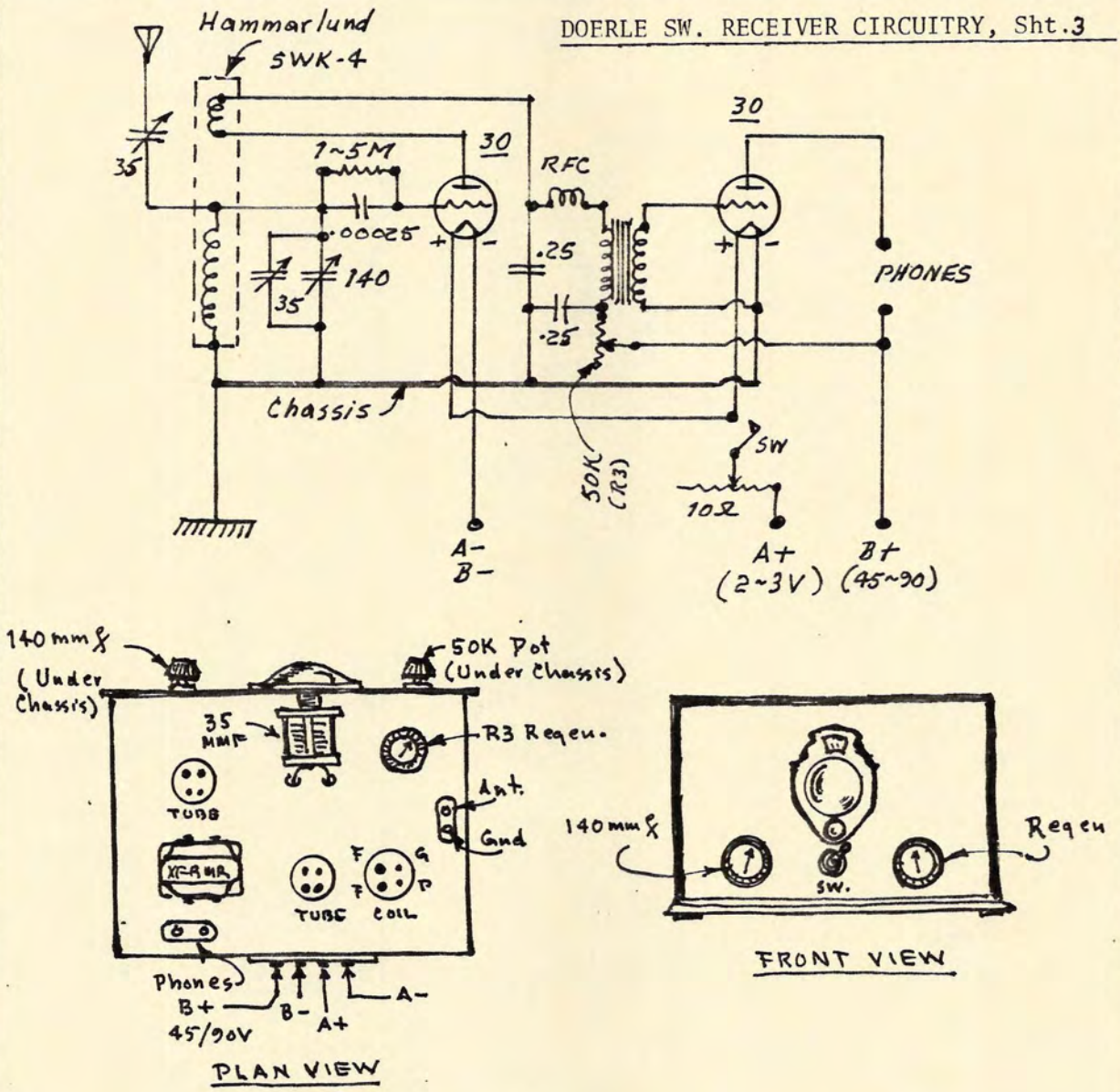


ALIGNMENT PROCEDURES:

1. Tune both variables simultaneously; best regeneration position occurs when a hiss is heard.
2. Set main tuning dial, then rock REGEN. control over entire range. Whe hiss occurs, leave REGEN control alone.
3. Moving main variable requires moving REGEN. control to track.
4. If no hiss is heard, only clicks or hum, DET plate voltage is too high; or grid-leak is wrong value.
5. Stations are located by their squeals. When found, detune REGEN. control to lowest audible point; then readjust both variables.
6. Use 15 MFD midget for finer tuning. This midget functions as a band-spread control.



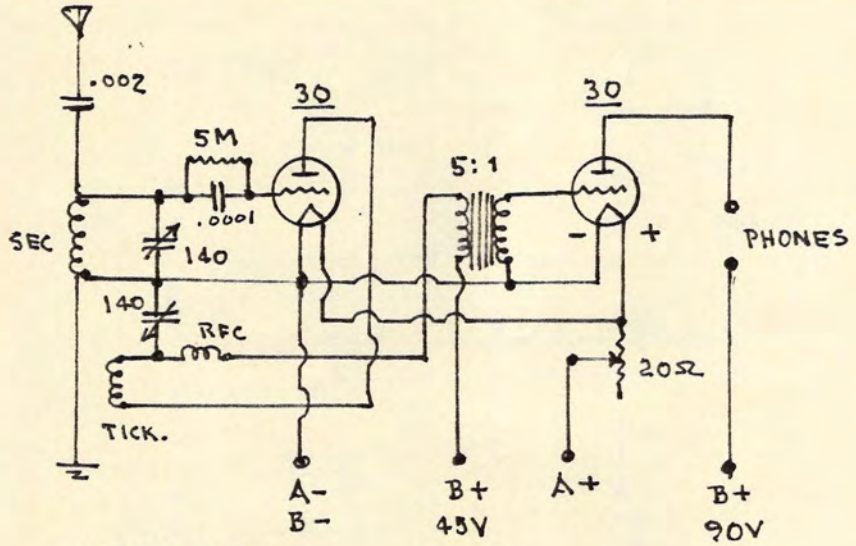
DOERLE SW. RECEIVER CIRCUITRY, Sht.3



NOTES: To Tune: 1. Trim ANT until circuit breaks into osc.
2. Tune with 140 variable.
3. Band-Spread with main dial variable.
4. An additional AF stage may be added for loud-speaker operation, but should be mounted on a separate chassis.

Panel = 7" x 10", 16ga. Al. Al.
Chassis = 11" x 13.5" x 2", 16 ga. flat sheet bent into "U" form to measure 9.5" x 7".
(2) 1.5V Dry-cells used for FIL voltage.

DOERLE SHORT-WAVE RCVR. SERIES: 1931



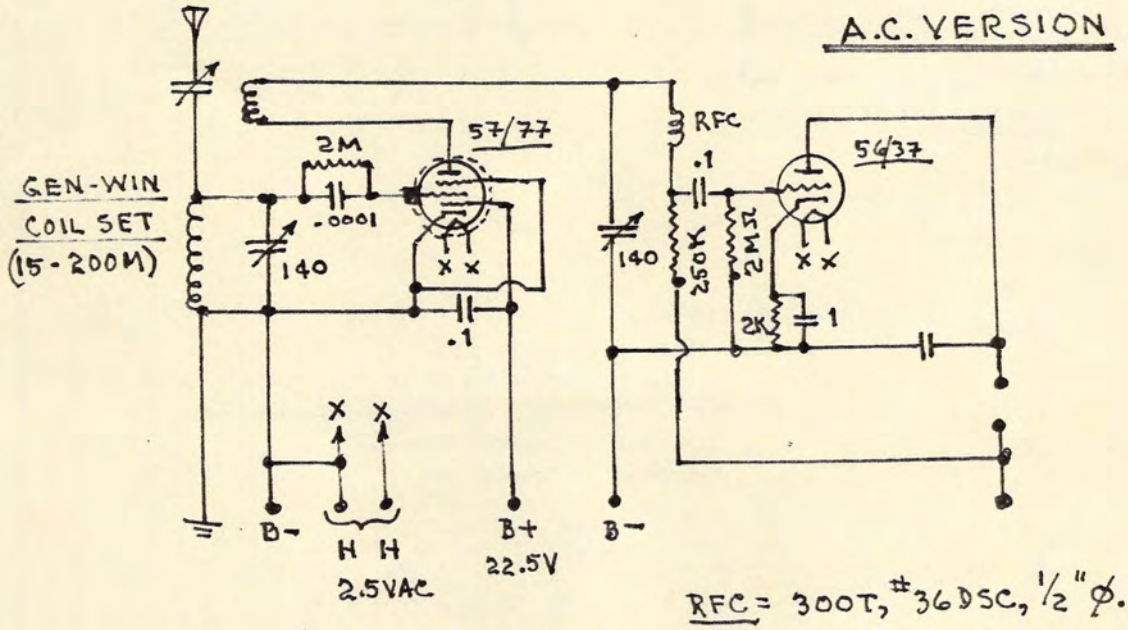
COIL DATA:

Range	SEC	TICKLER
15-45M	5T	6T
35-75 "	9T	5T
60-125 "	16T	6T

#26 Enamel Wire; no spacing.

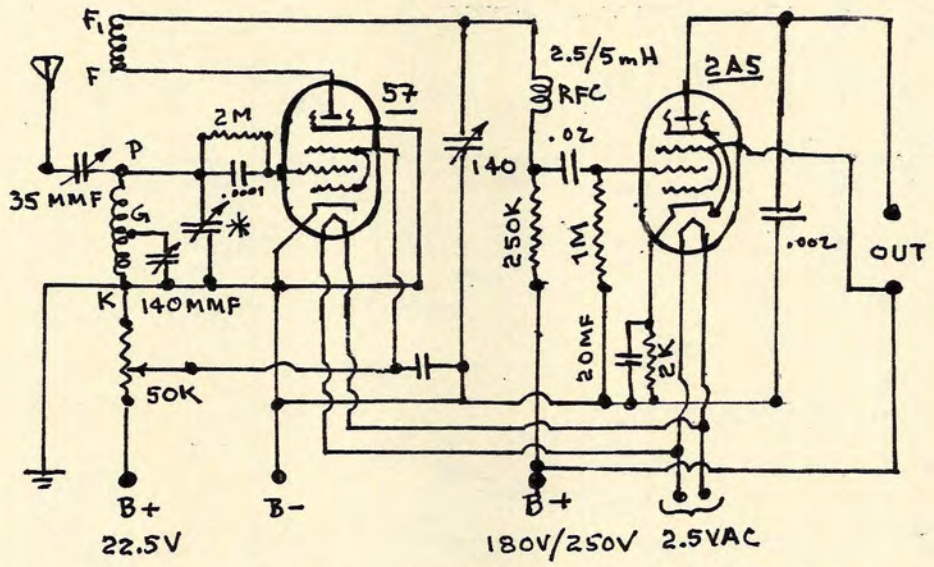
PANEL = 7" x 10" x 3/16".
BASEBOARD = 9" x 11" x 1/2".
BATTERY OPERATION ONLY.

A.C. VERSION

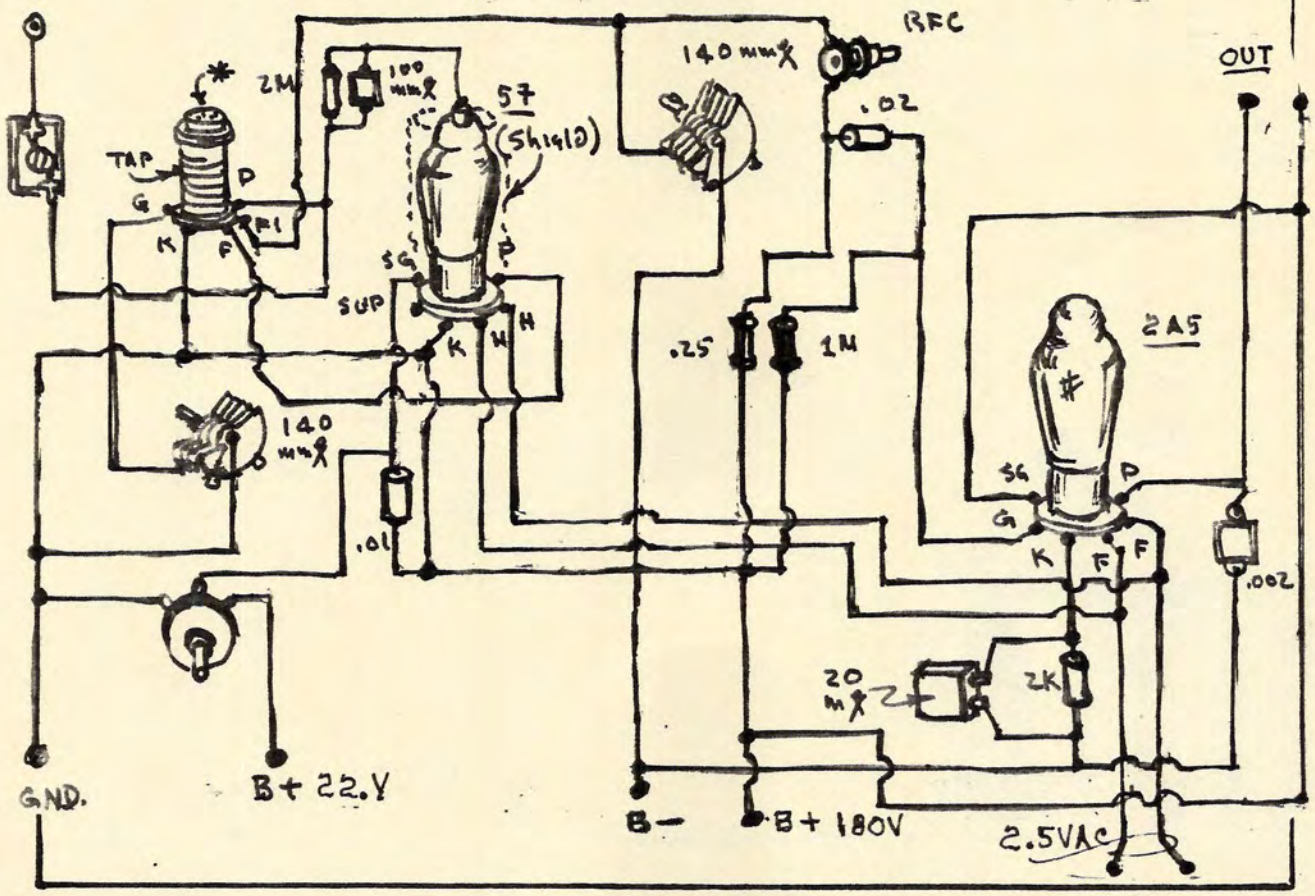


RFC = 300T, #36 DSC, 1/2" ϕ.

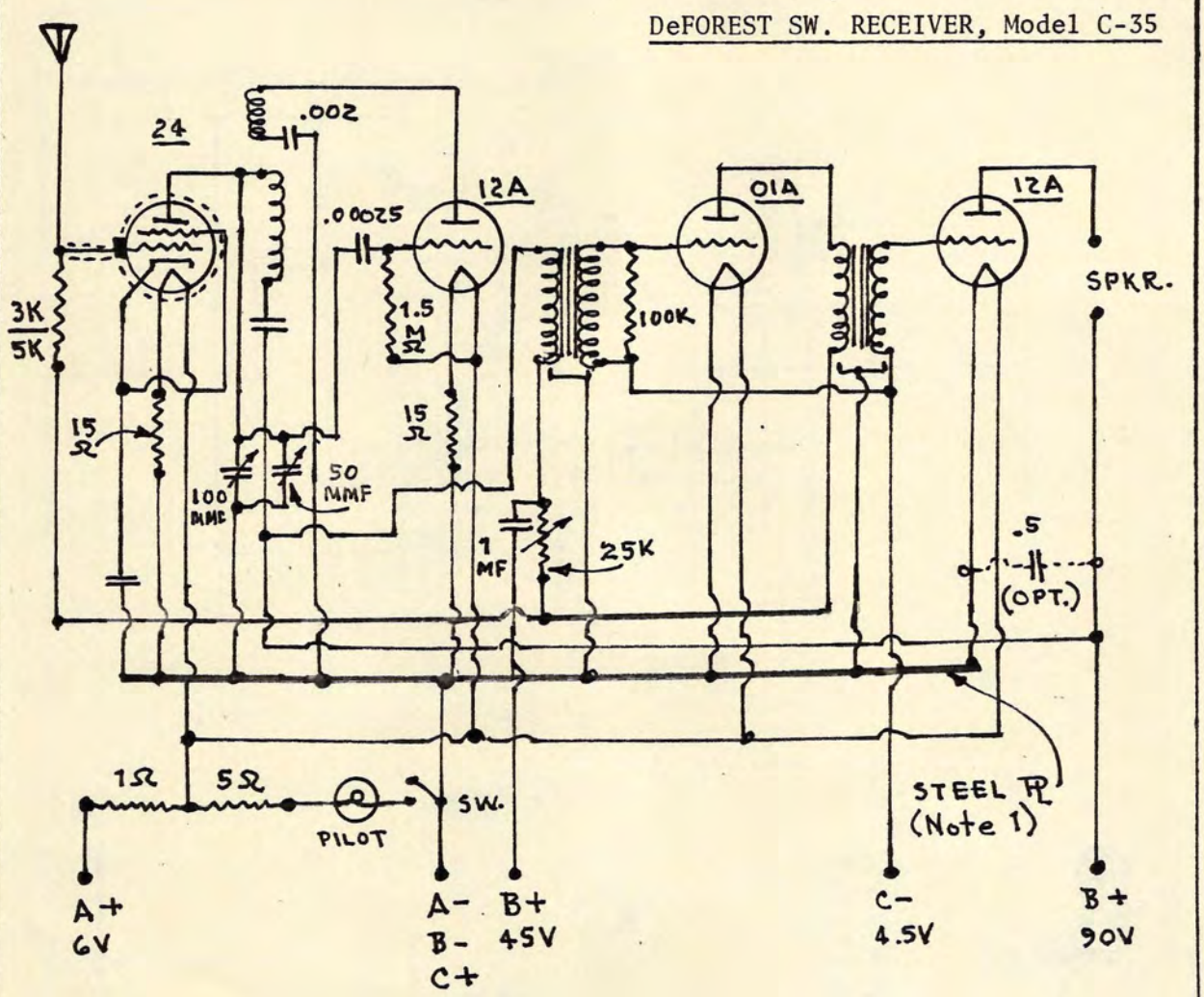
DOERLE SW. RECEIVER CIRTRY, Sht. 4



(*) = Padder mounted in top of coil form. First version used 30 tubes and an AF xfrmr. Na-Ald coils used originally.

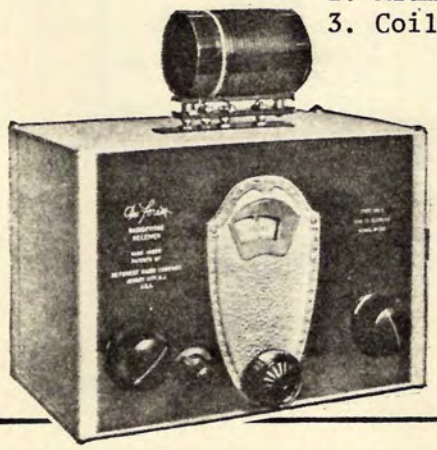


DeFOREST SW. RECEIVER, Model C-35

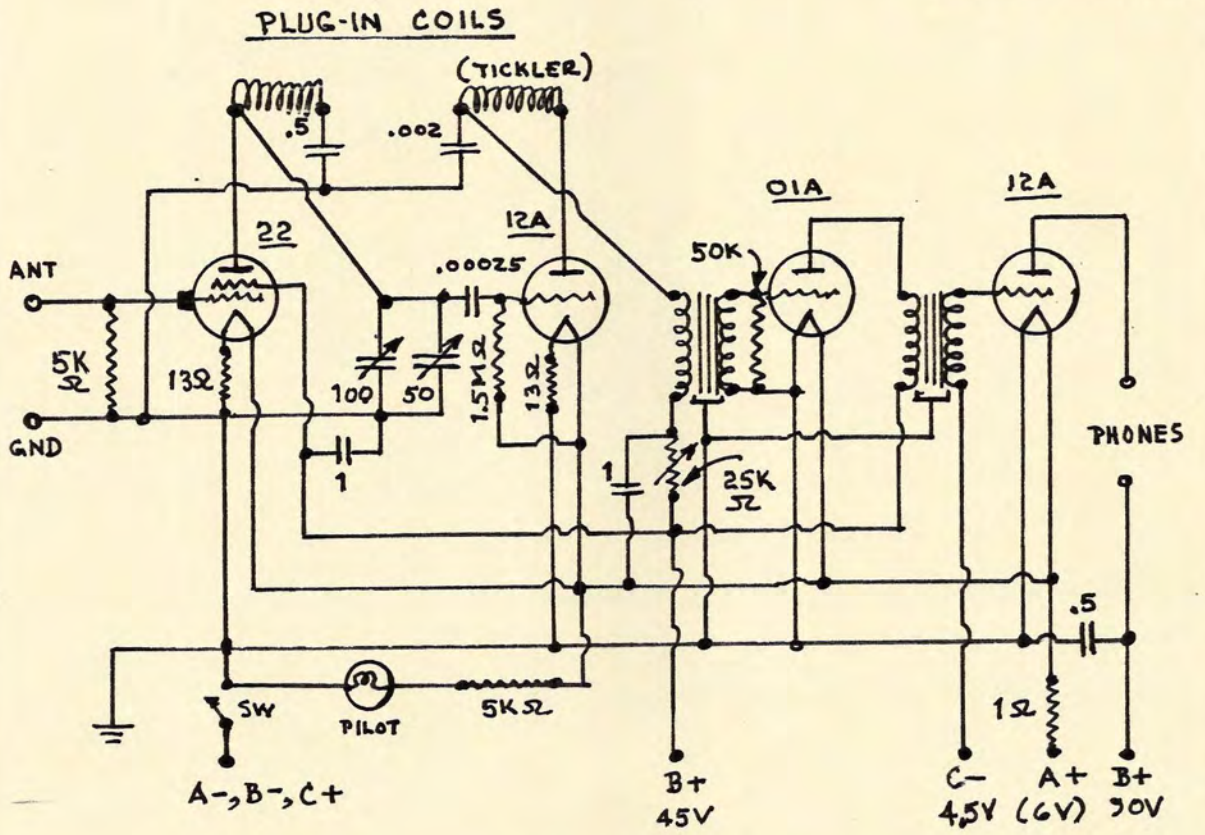


NOTES:

1. GND may have to be divorced from A- string.
2. Aluminum cabinet 5" x 6" x 9"; original price $75,'30.
3. Coil Data: PRI = #18 Enam., 7 Turns @ 6 T per inch.
   SEC = #28 Enam., 3 " " " " " ".
   Wound on 4-prong tube base; .125" spacing between windings.



DeFOREST SW. RECEIVER, Model KR-1
(14 to 950 Meters)



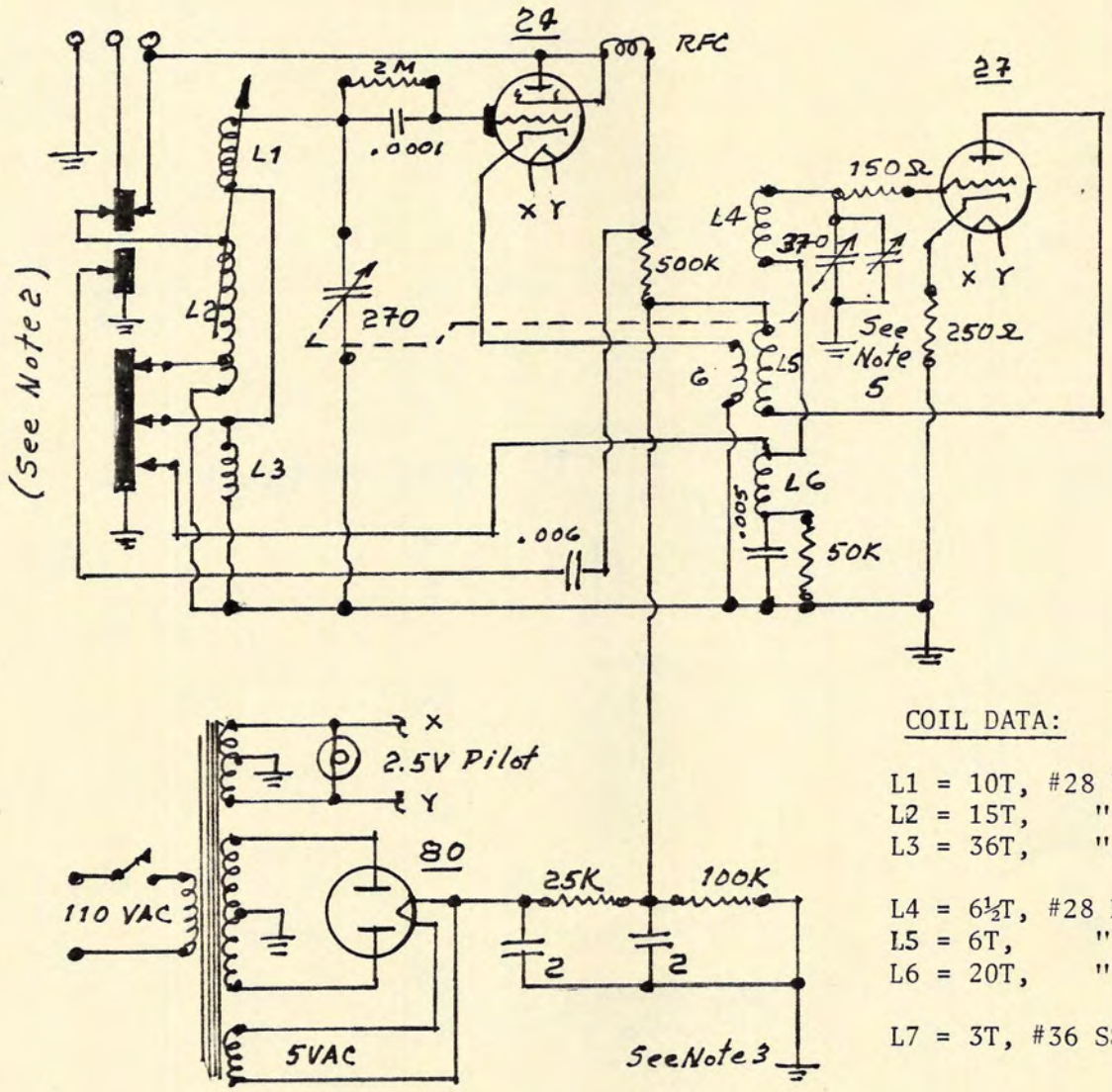
COIL DATA

PRI	TICK.	METERS	Per IN. TURNS	TICK. SPACE
3T,#18 Enam.	3T,#28 SSC	14-25	6	.125"
7T "	3T "	23-49	11	"
18T "	4T "	45-95	11	.250"
26T,#28 SSC	6T "	93-105	Tight	"

NOTES:
1. Coils were mounted on top of aluminum cabinet.
2. Sub-panel located 3/4ths of the way from top of cabinet.
3. Tube sockets mounted upside down.
4. Variables and Regen. controls mounted on front panel.
5. There was only a minor difference between this model and DeForest's Model C-35. The major difference seems to have been in the ANT tube. Compare over-leaf.

NOTES

"ERLA" SW. CONVERTER, 1928



COIL DATA:

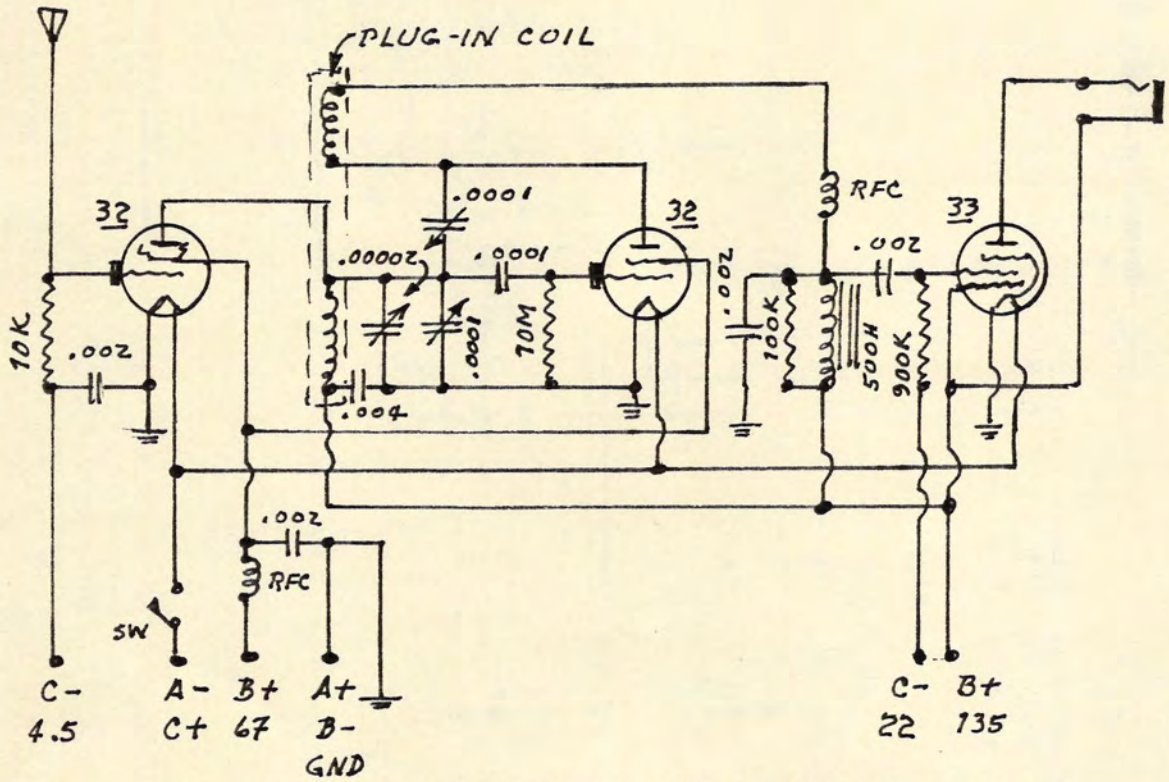
L1 = 10T, #28 Enam
L2 = 15T, "
L3 = 36T, ", C.'

L4 = 6½T, #28 Enam
L5 = 6T, "
L6 = 20T, "

L7 = 3T, #36 SSC

NOTES:
1. Vernier was a copper disc sliding inside L1.
2. Switches were one unit.
3. Chassis was ground.
4. 270 MMFD variable condenser joins L1 to GND.
5. 370 MMFD variable condenser joins L4 to GND.

EAGLE BAND-SPREAD SW. RECEIVER, 1930
(17 to 200 Meters) Gross Radio Co.



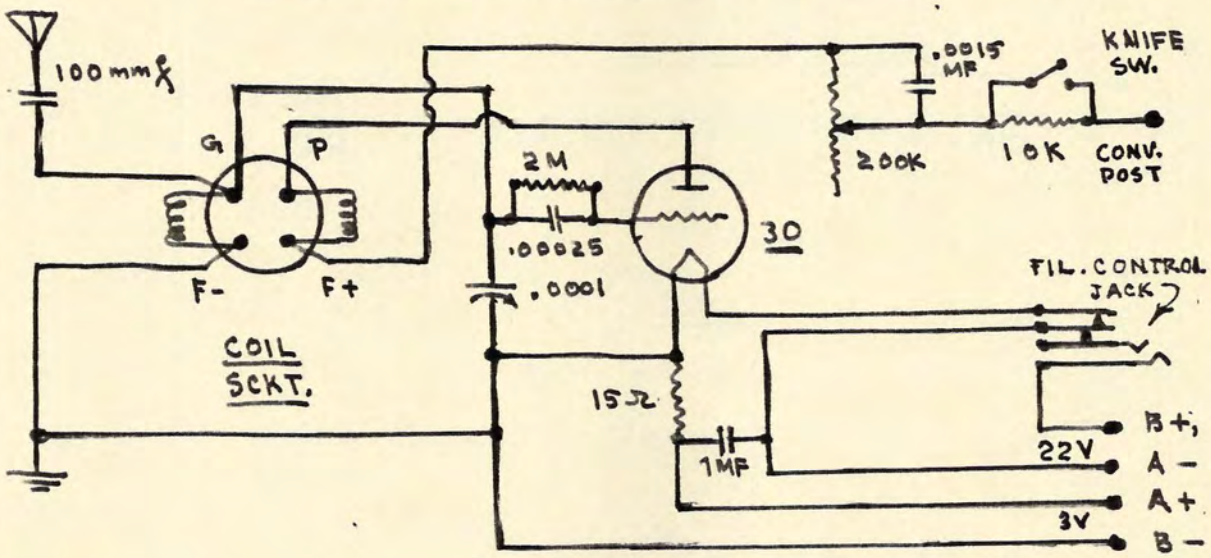
USE ANY COMMERCIAL 4-PRONG COILS.
The .00002 Variable is the Band-Spread.

EMANON SHORT-WAVE ADAPTERS & CONVERTERS

The following few pages depict various SW. adapter and converter schematics which are, in a very real sense, "orphans". That is, they appeared in divers media without a credit-line or an acknowledgement of their derivation.Where an "orphan" schematic was an obvious derivation from another schematic with a name, such a schematic has not been included here. (EMANON is simply No-Name, spelled backward.)

* * *
* *
*

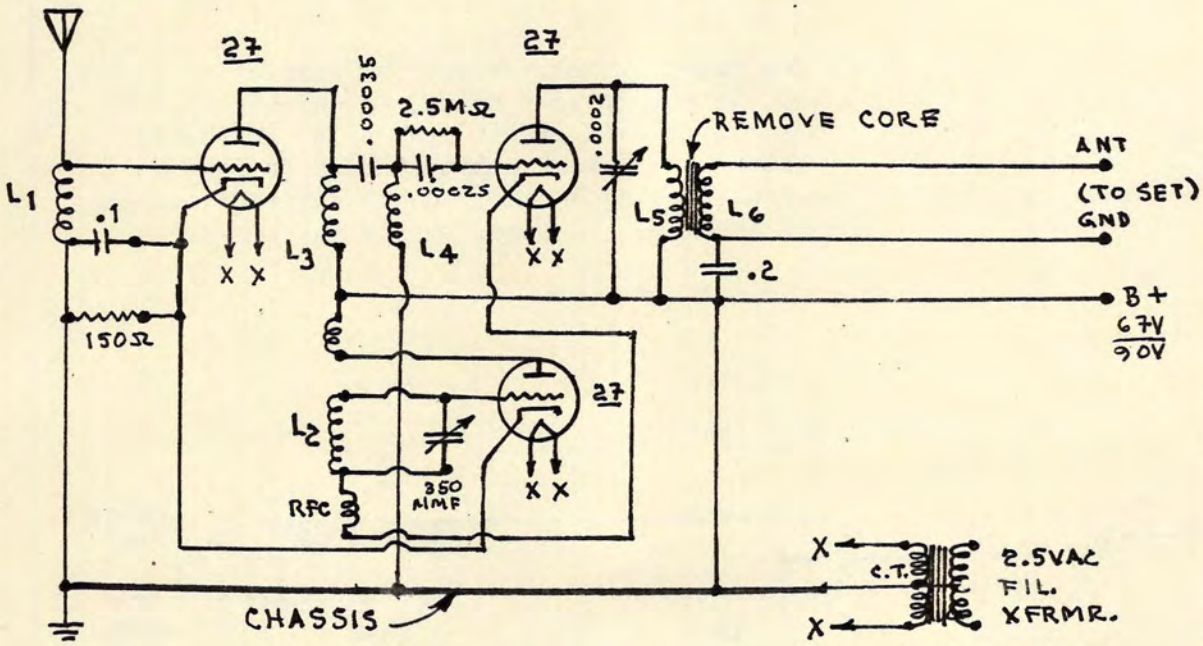
SW. ADAPTER, 1933 (SWC - 1-'33):



NOTES:
1. When used as an A.C. adapter, transfer ANT & GND to unit; connect rcvr. GND to adapter GND post.
2. Transfer DET tube from rcvr. to adapter. Type 30 is shown, but other types may be used.
3. If plate voltage is too high, open knife-switch.
4. Any commercial 4-prong plug-in SW. coils may be used.

Cabinet was 8.75" x 6.5" x 2.75".

EMANON SW. CONVERTER, 1931



NOTES:

1. All coils except L5 & L6 = .25 mH.

2. L5/L6 Coil Data: #28 enamelled wire; 1.75" Ø form; .125" space

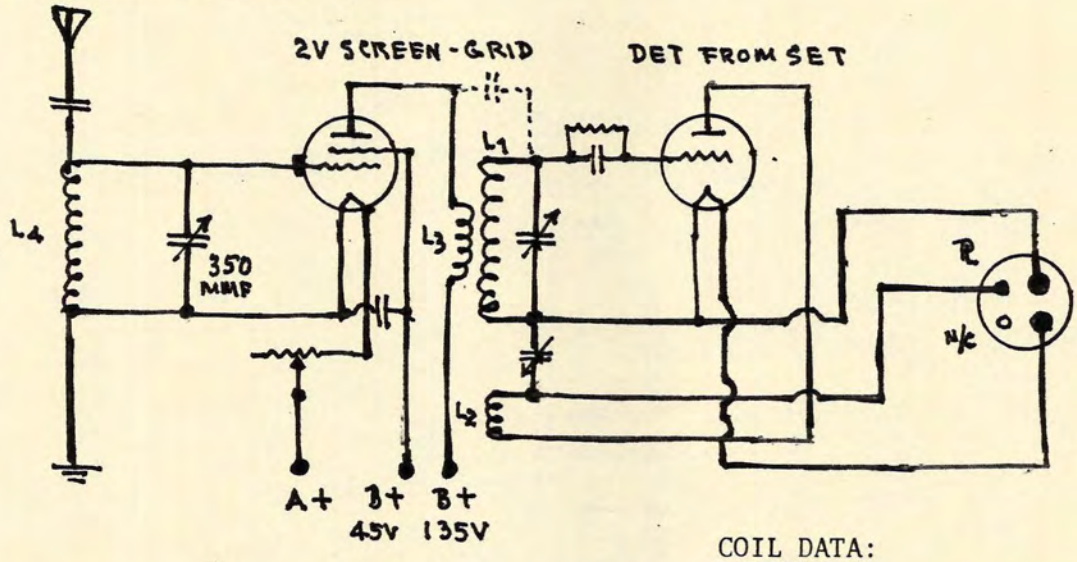
   L5 = 80 Turns
   L6 = 30 Turns, tapt @ 10 and 20 Turns.
   The .0002 midget variable shown worked best when shielded.

3. Where a stage of amplification follows converter's output. BFO of converter may be amplified to 1,500 KC.

4. Converters do not work well with super-hets where there is no amplification ahead of the 1st DET in set.

5. If hum occurs, disconnect GND connexion from set.

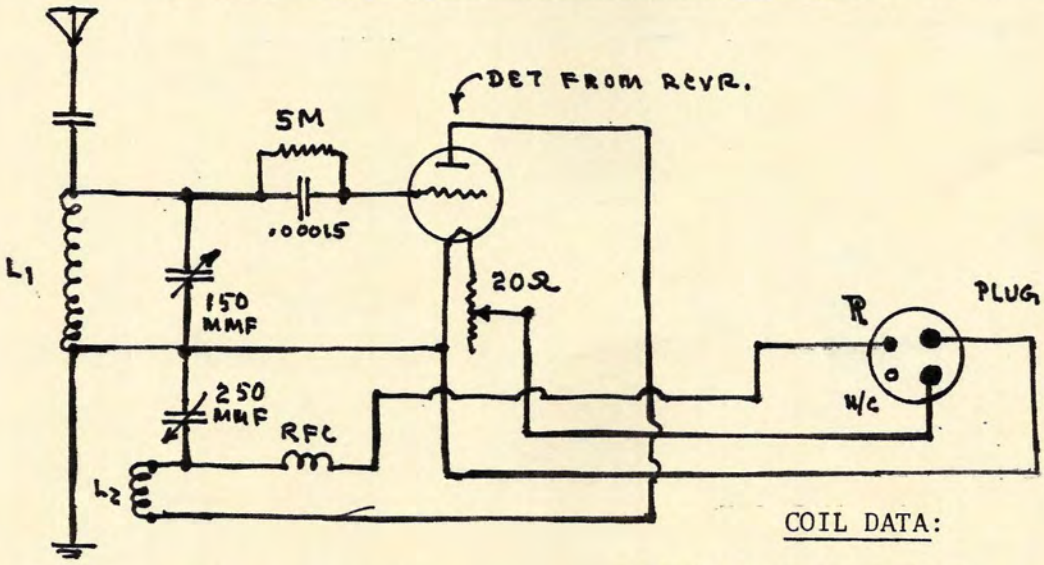
EMANON SW. ADAPTERS, 1927:



COIL DATA:

RFC = 100T, ¼" dowel, DCC.
Too high plate voltage will cause hissing.

L1 = 4T - 5T - #22 on Tube Base.
L2 = 18T - 6T - "

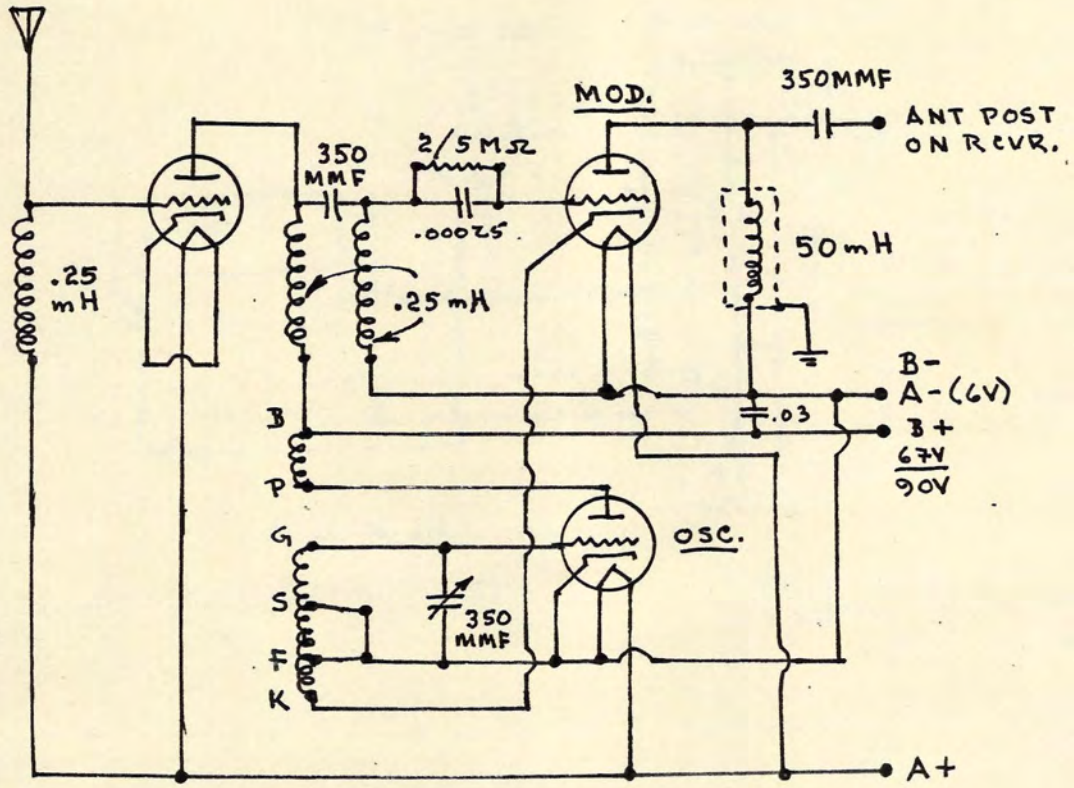


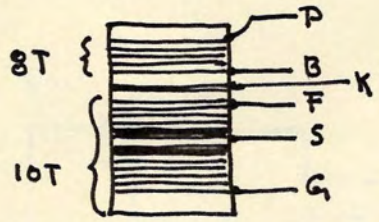
COIL DATA:

L1 & L2 same as above.
L3 = 100T, #32, 2" Ø form. (*)
L4 = 4T, #22, on UX base.
L1 & L2 = 4T Tickler - 9T - 18T

(*) = May be a SW. choke; if used, add .00025 MFD capacitor at dotted line.

EMANON SW. CONVERTER, 1928





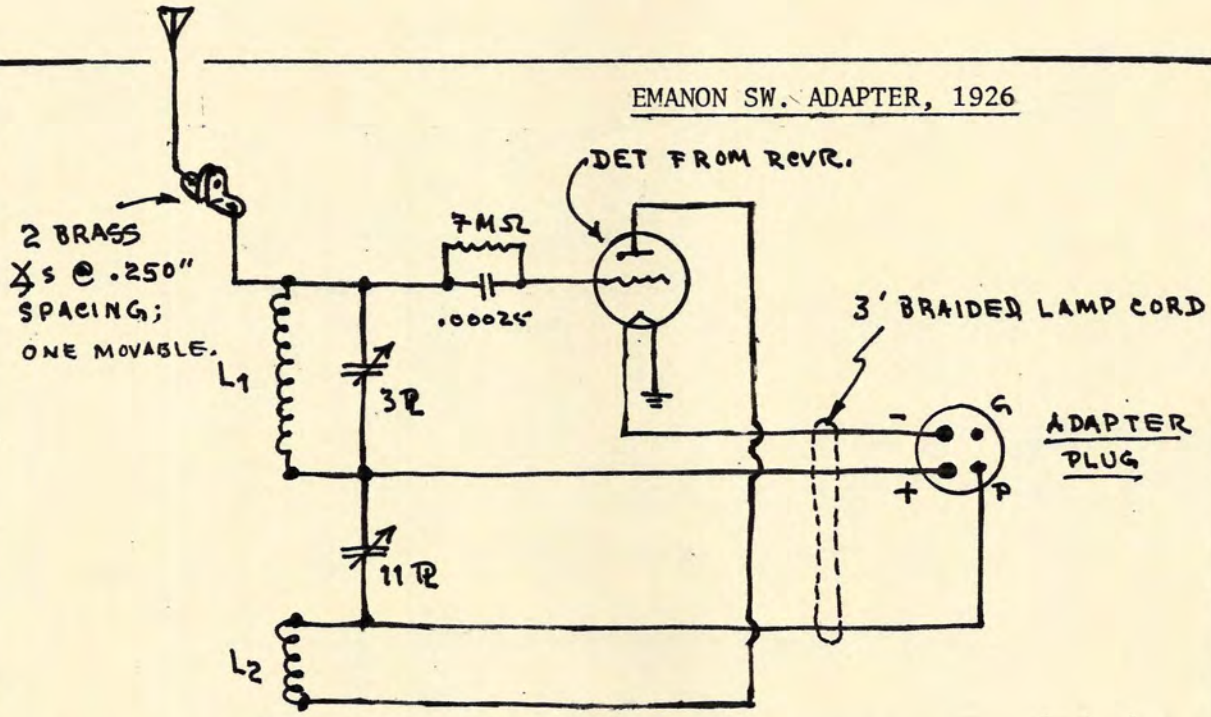
Coil Form = 1.75" Ø x 13/16"

F = 2 Turns from "K" end, tapt.

S = 2 Turns from "F" end, tapt.

G = 6 Turns.

EMANON SW. ADAPTER, 1926

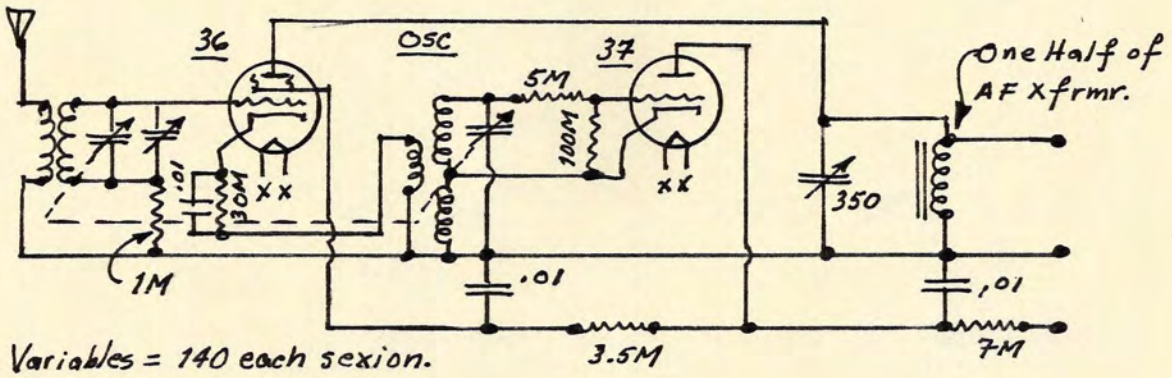


NOTES:
1. Covers 33 to 45 meters only.
2. Rheostat on set controls adapter voltage.
3. 11 plate variable = regeneration.
4. For use with battery sets only.

COIL DATA:

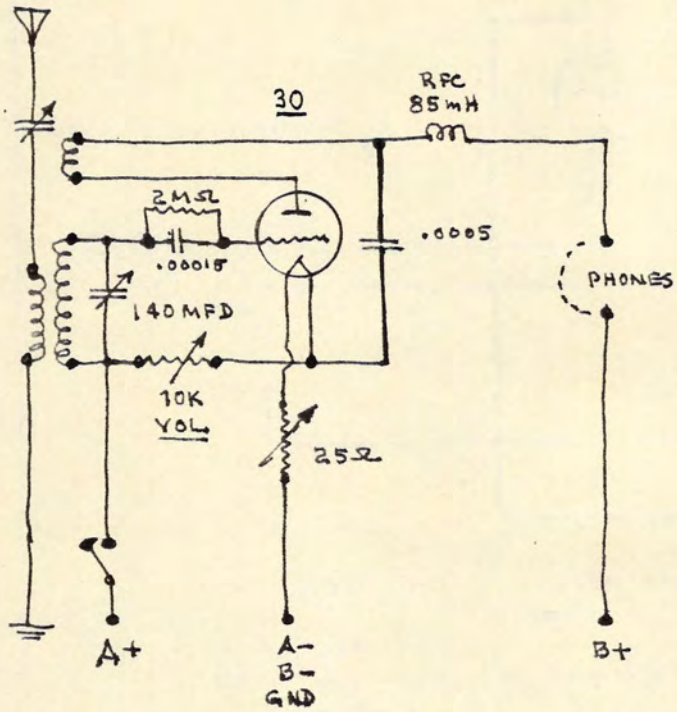
L1 = #18 Bell-Wire, 7T.
L2 = #18 Bell-Wire, 4T.
Both coils wound on same form, 3"Ø x 2".

SW. CONVERTER, 1927



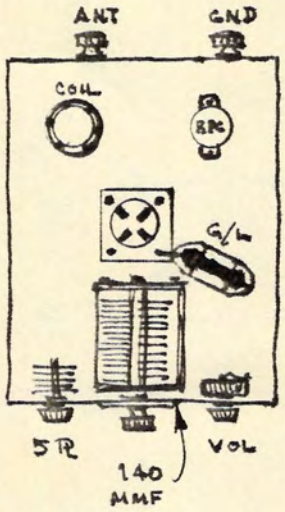
Set receiver dials at 750 KC.
A+ = 6 Volts, AC or DC.

SHORT-WAVE ADAPTER, 1928

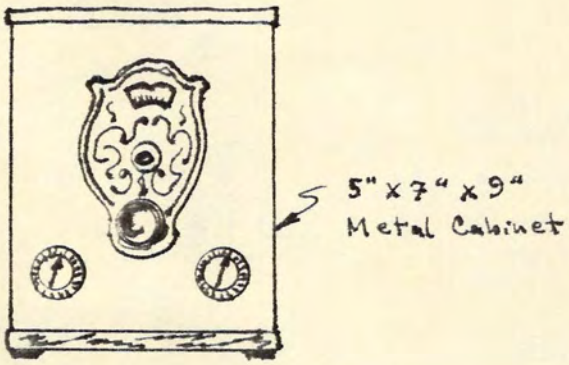


NOTES:

1. 6-Prong coils with fixed tickler & primary.
2. Jumper phone posts if fed into an AF amplifier.
3. Aluminum cabinet with a wood base.

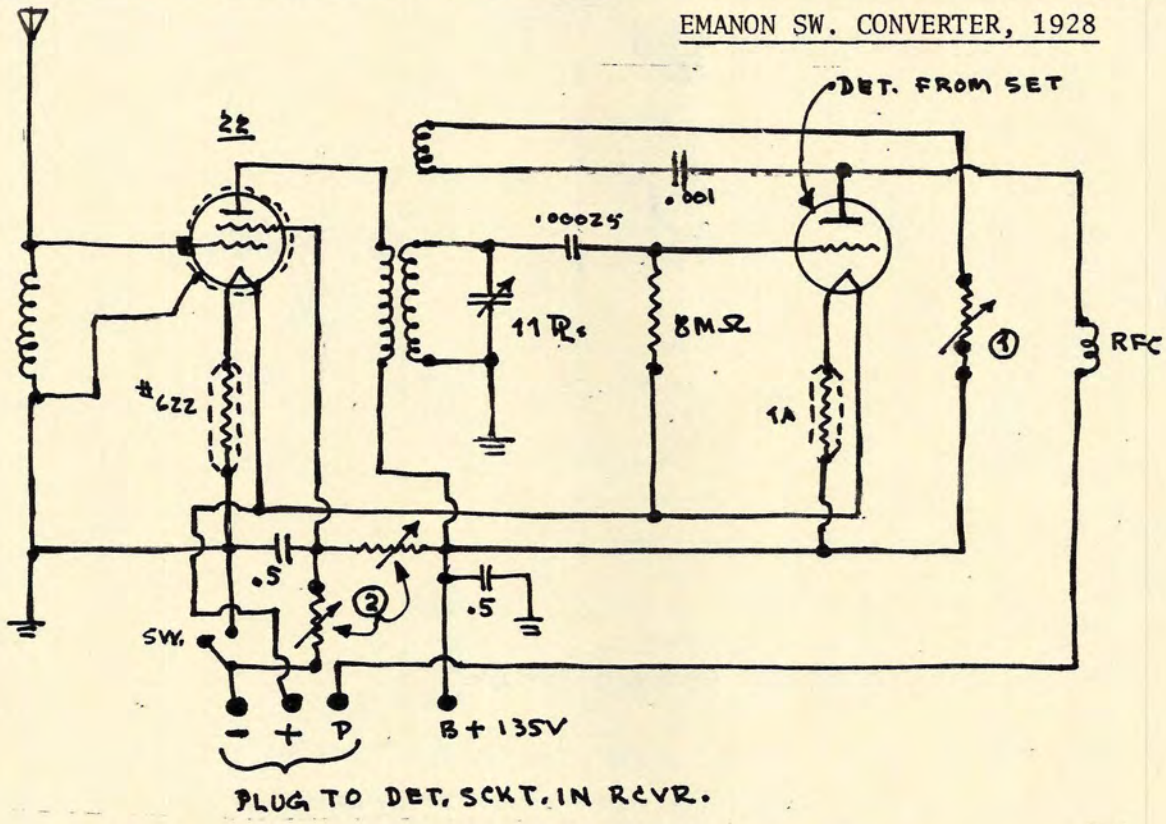


PLAN VIEW
(Cover Removed)



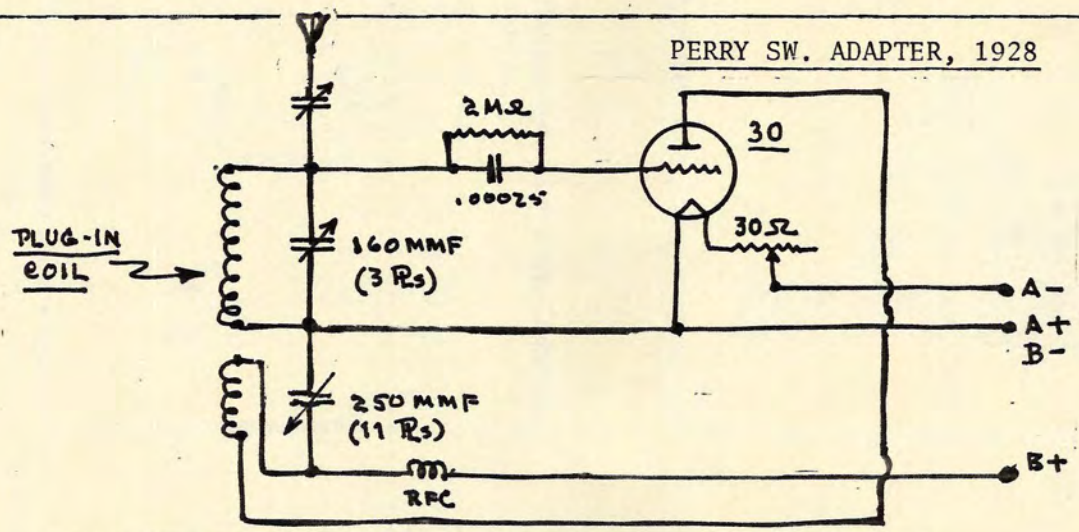
ELEVATION

EMANON SW. CONVERTER, 1928



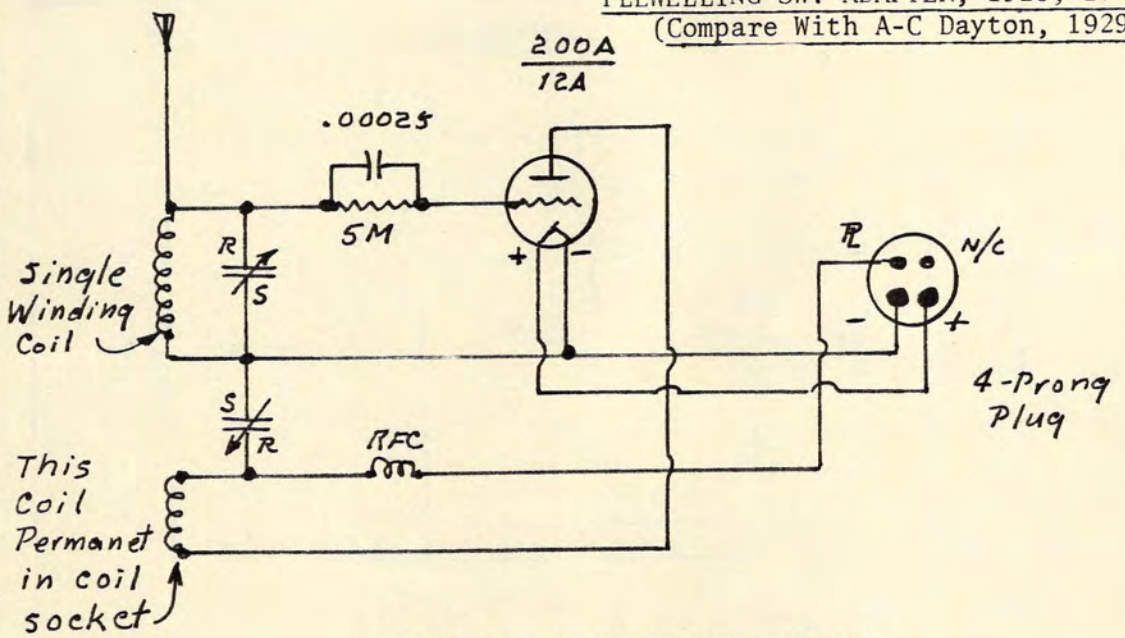
Raised sub-panel, with sub-panel mounted sockets.
(1) = CLAROSTAT Grid-Leak. (2) = CLAROSTAT "Duplex" .00025 & .001 sub-panel mounted.
GND is A- leg.

PERRY SW. ADAPTER, 1928



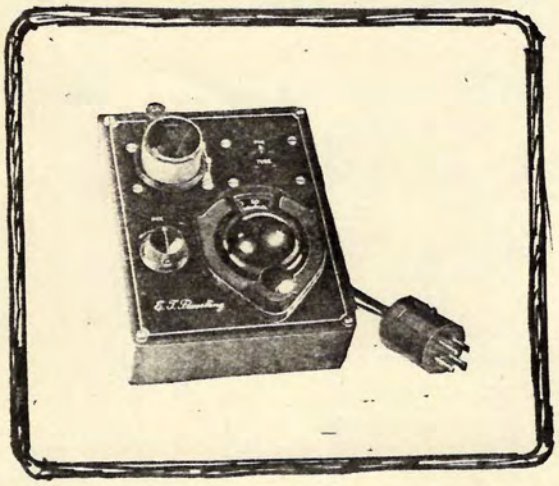
NOTES:
1. If regeneration is erratic, change grid-leak.
2. A 50K pot. may be inserted in receiver DET lead.
3. A 3K trimmer in GND lead can improve reception.

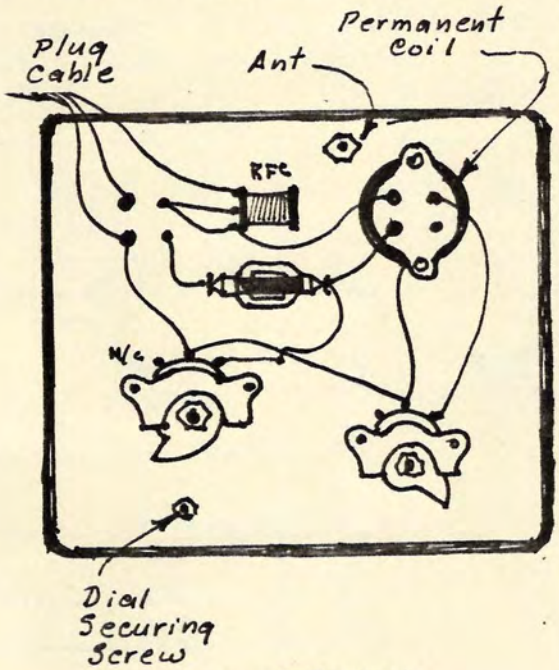
FLEWELLING SW. ADAPTER, 1923; 17-84M.
(Compare With A-C Dayton, 1929.)



NOTE NON-CONVENTIONAL STATOR CONNEXIONS.

Set RCVR dials @ 400 to 500 meters, w/ DET full on. Signal controlled by rheostat on RCVR.

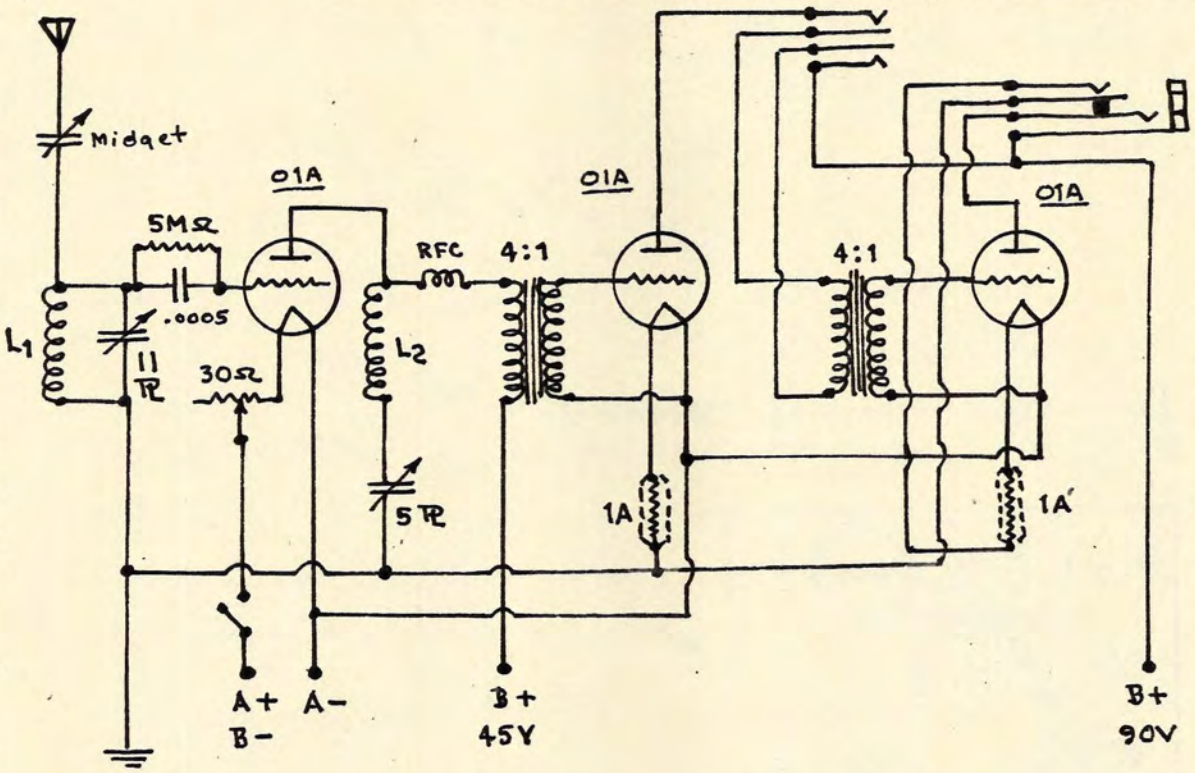


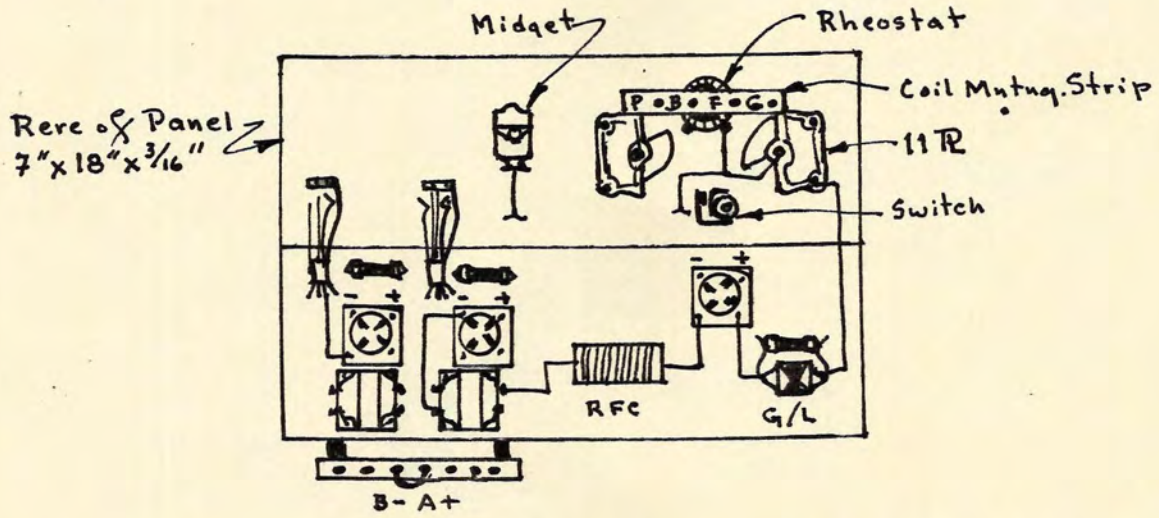


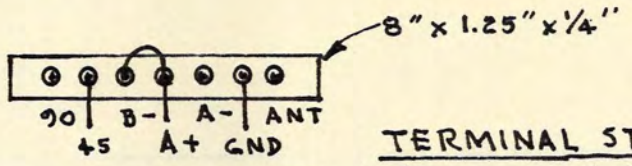
CABINET = 7" x 5½"

BACK of PANEL

FLEWELLING SW. CONVERTER, 3xP VERSION, 1925; Sht. 1







TERMINAL STRIP

FLEWELLING SW. CONVERTER, 3XP VERSION, 1925; Sht. 2

COIL WINDING DATA

Std. BC.: L1 = 40T,#20 DCC
L2 = 20T, #20 DCC
Form = 3" Ø x 6"

RFC

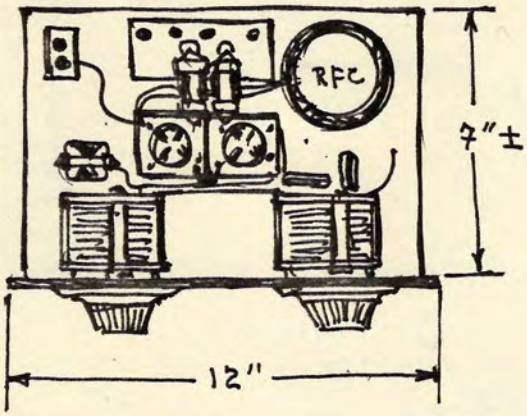
100 Turns, #28 DSC, 1" winding on a 3" Ø form.

SW. Coils: 20 Meters = L1 & L2 3T each.
40 " = L1 & L2 5T " .
75 " = L1 & L2 10T " .
150 " = L1 25 Turns
L2 15 Turns

All coils wound with #22 DCC wire.

Experimental Coil: L1 7T, #20 DCC. L2 13T, #20 DCC.

NOTE: The above data applicable to the 3XP version; the data which follows are of Flewelling's original converter, 1924.

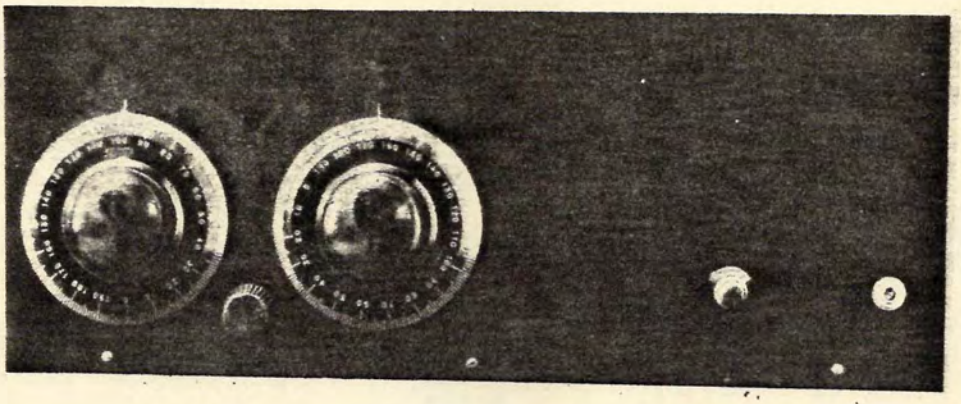


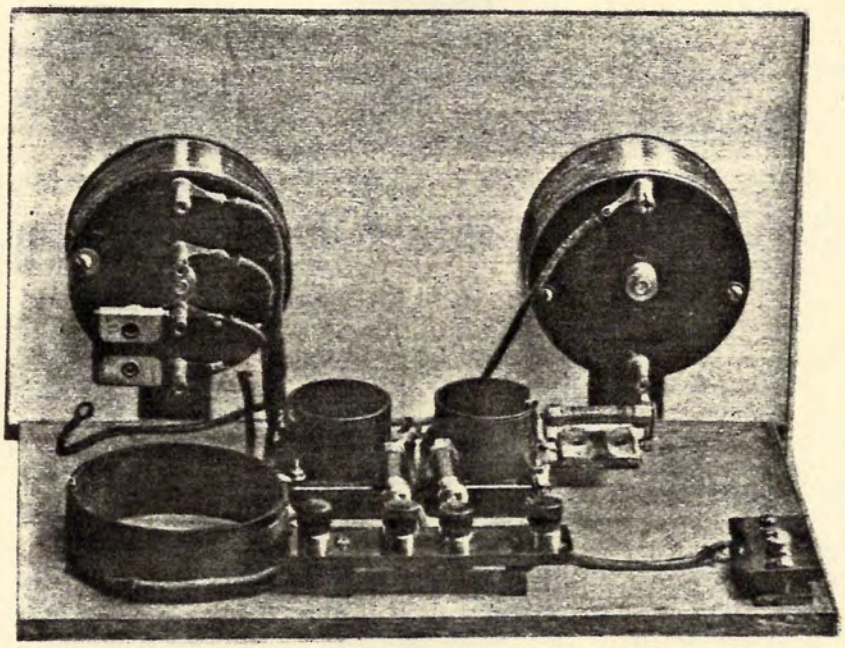
Coils Removed for Clarity

1. Coil data same as above.
2. Variable condensers must be at least 7" apart.
3. Panel = 7" x 12".
4. For use with 5-tube set.
5. ANT trimmer was midget.
6. Set dials around 95.
7. Tune in station with the converter.
8 Adjust pots and dials of receiver; leave alone.
9. Tune set with converter.

(ADDENDUM: In 1923 Flewelling designed a SW. adapter that could also be used as a 1-tube receiver. This design was later adopted by Walker and released as the "Multi-Unit" and the "Flexi-Unit". Walker was also the exclusive distributor for Victoreen products, John Victoreen getting a royalty.There was a Charles Victoreen, d.b.a. VEE-DEE products in 1928, but apparently he did not survive.)

FLEWELLING SW RECEIVER, 1926: Sht.1





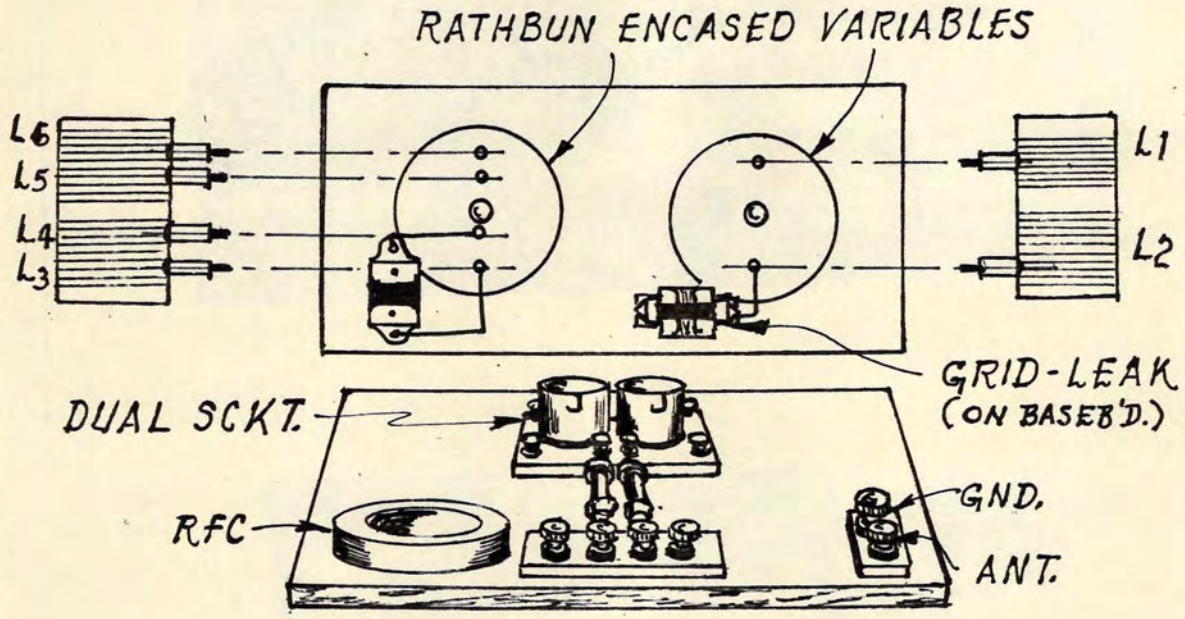
REAR VIEW w/ PLUG-IN COILS REMOVED
(See Sht. 3 for coils in place.)

NOTE: The 3XP version used 3 tubes & a coil-mounting strip spanning the two variables; see page 55.

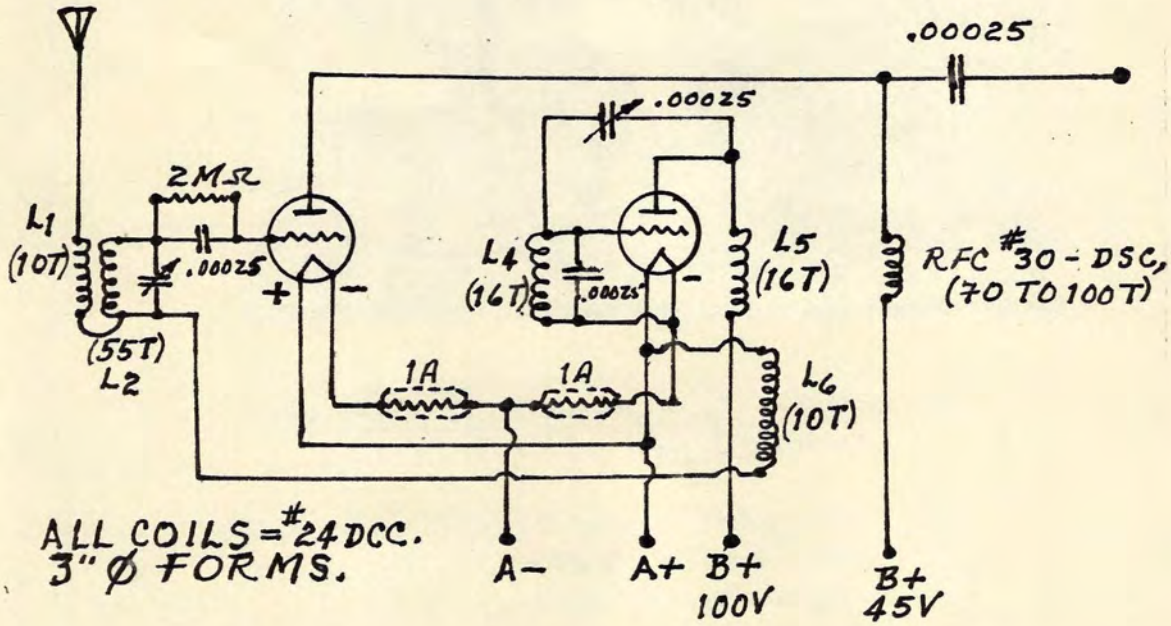
(RITH)

FLEWELLING's SW. CONVERTER ORIGINAL VERSION, 1925

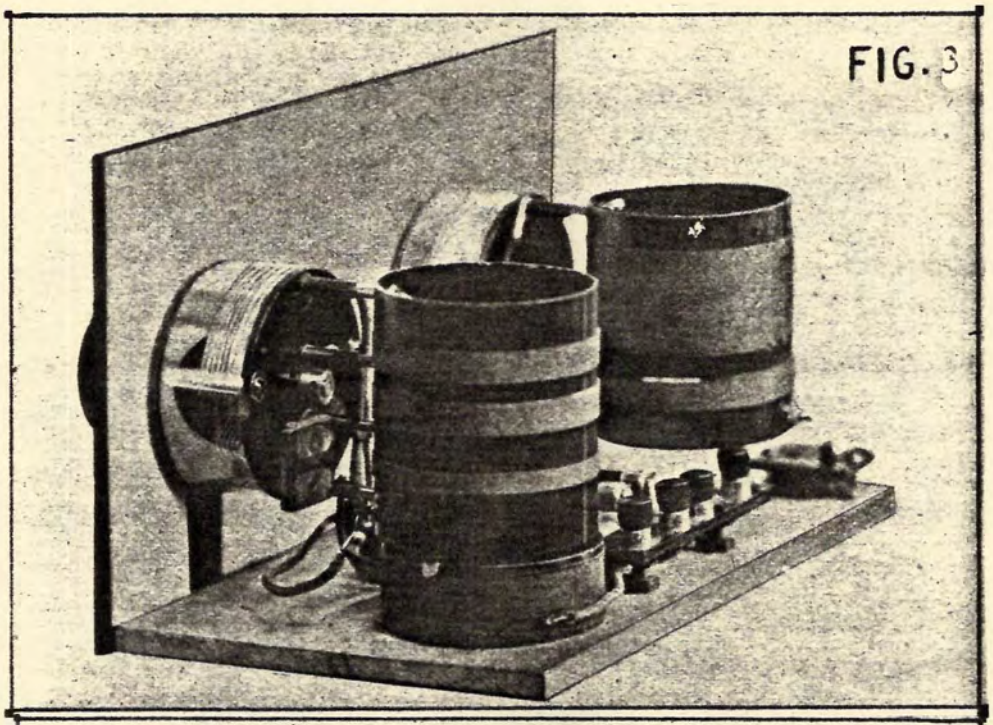
(Sht. 2)

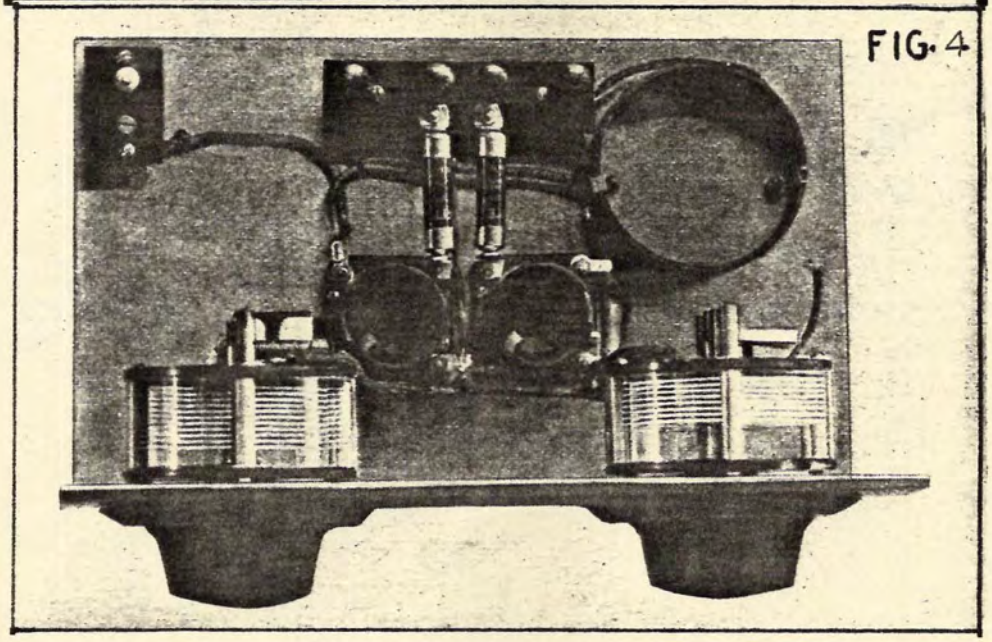


FLEWELLING's ORIGINAL CONFIGURATION

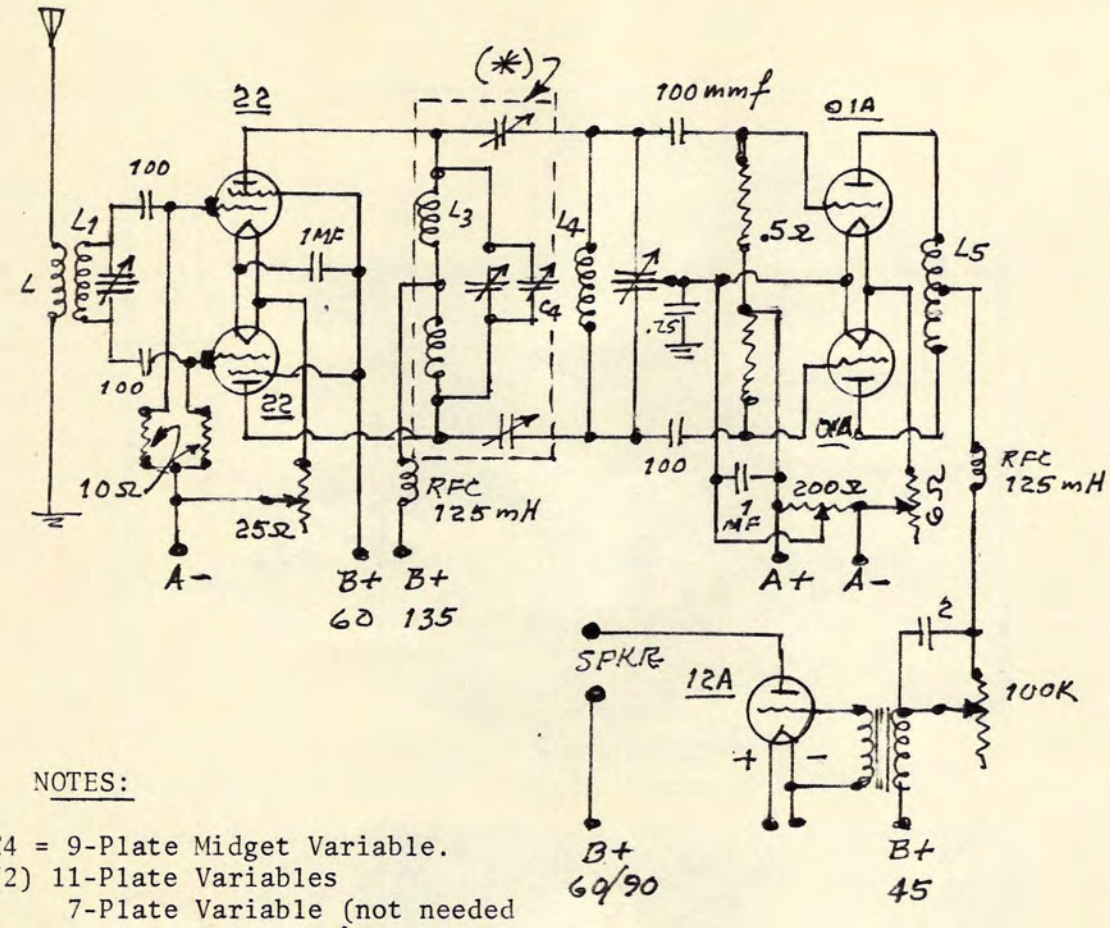


FLEWELLING SW CONVERTER, ORIGINAL VERSION
(Sht. 3)





FLEET SW. RECEIVER, 1929



NOTES:

C4 = 9-Plate Midget Variable.
(2) 11-Plate Variables
7-Plate Variable (not needed if L3 is an RFC).
Variable shown with 3 lines have 2 stators with common rotor.
(*) = May be 2 pieces of metal, one piece movable.
AC Transformer should be grounded.

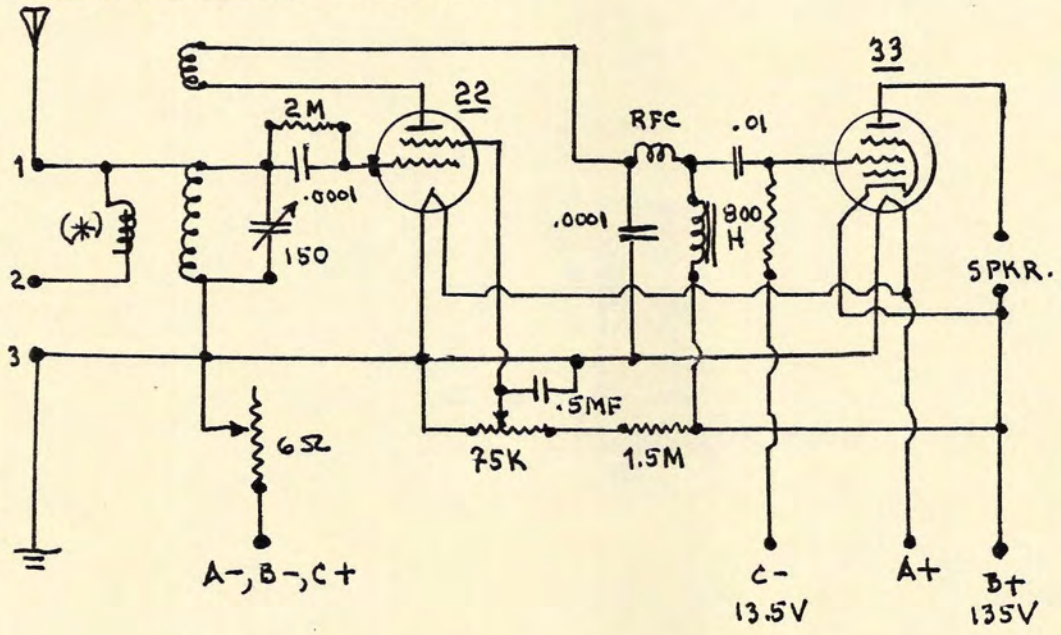
COIL DATA - S-M FORMS

ANT.	GRID RF	PL RF	GRID DET.	PL DET.
3 T	4T	4T	3T	4T
3	8	4	6	6
4	15	6	12	6
4	17	7	14	6
(L)	L1)	(L3)	(L4)	(L5)

Grid Coils = #16 Enamelled Wire
Plate & Tickler Coils = #22 Enamelled Wire

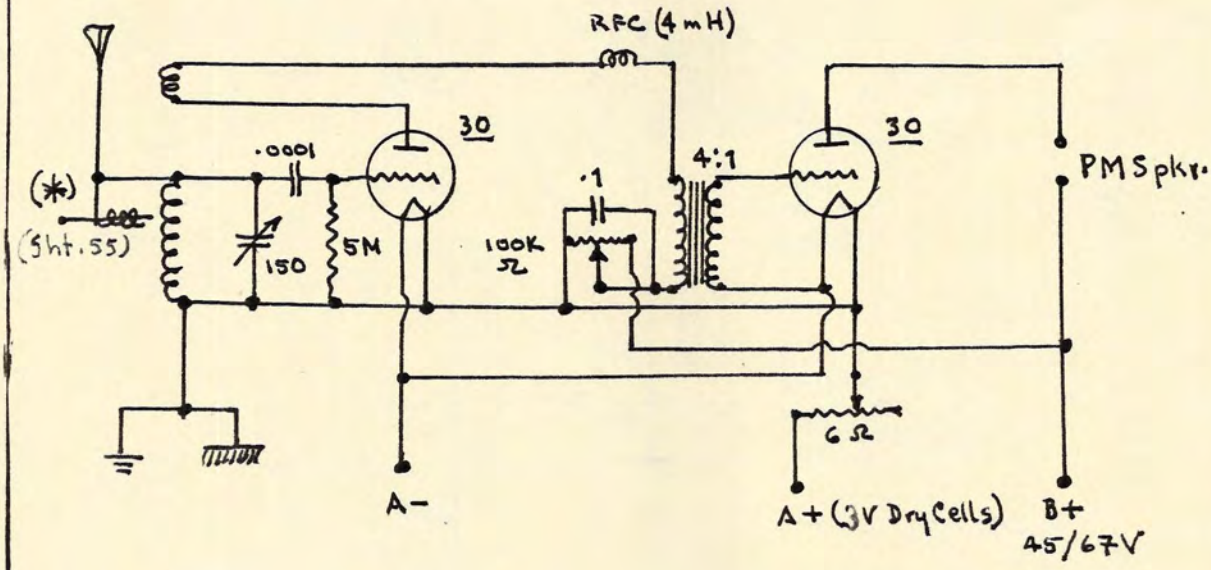
FEDERATED SHORT-WAVE RECEIVERS; Sht.1

"AIR-ROVER"; 10 to 200 Meters:



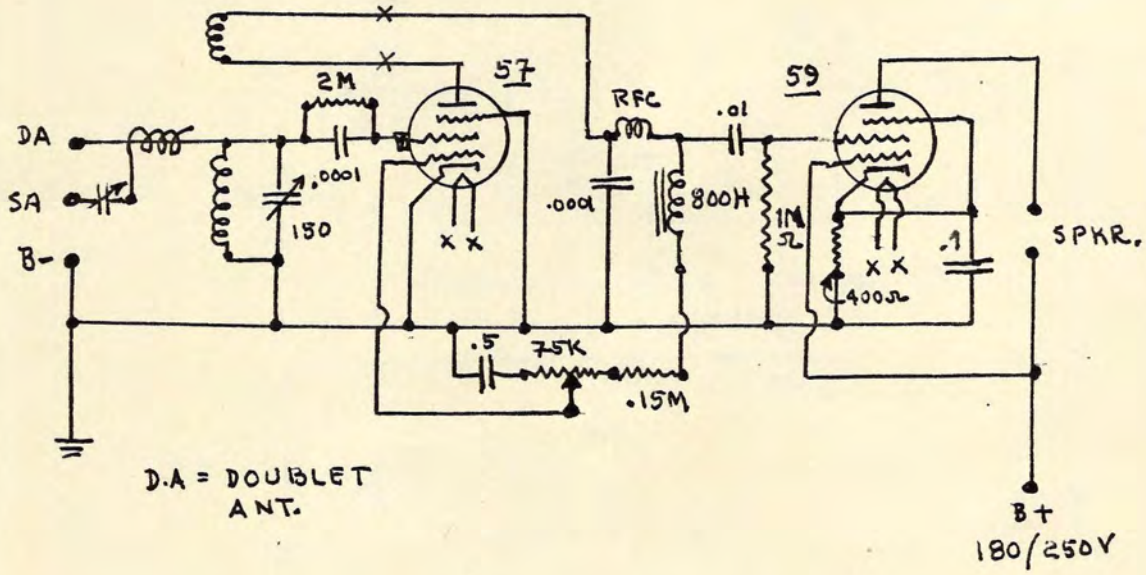
(*) = 1¼" Bare #14 Wire Wound over #18 Insulated Wire, 14 Turns.

"ARGONAUT"; 10-200 Meters:

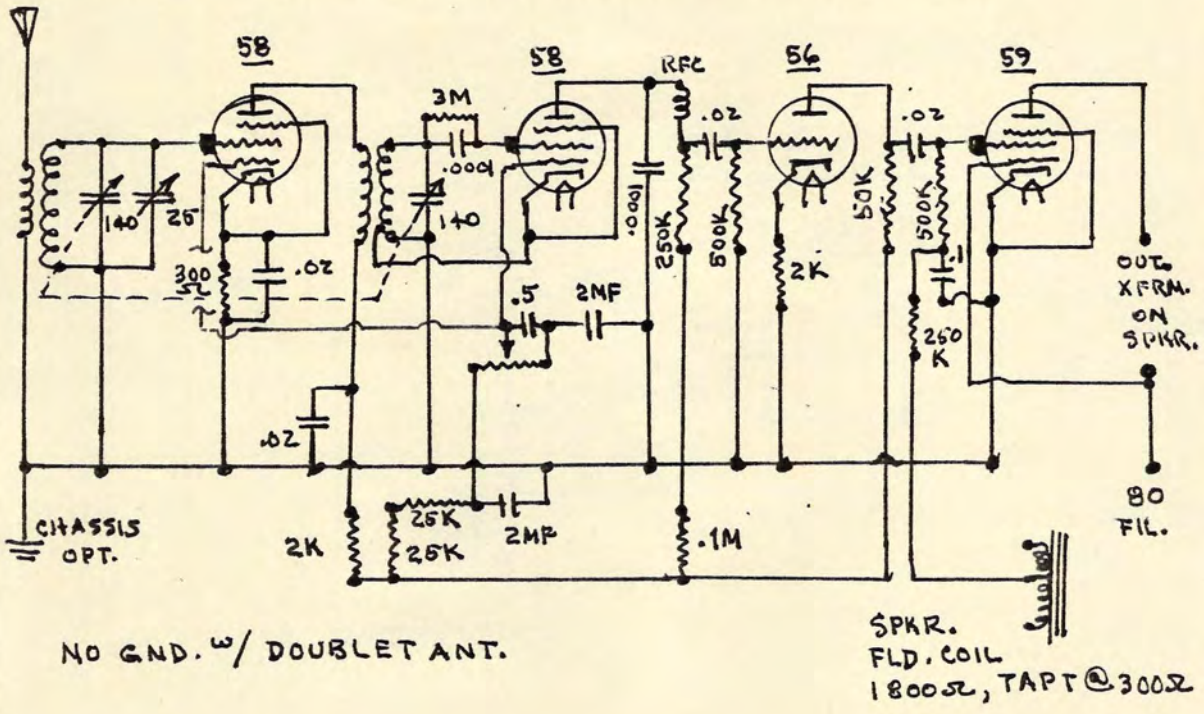


FEDERATED SHORT-WAVE RECEIVERS, Sht. 2

"VOYAGER" No. 45A": 15-200 Meters:



"DISCOVERER"; 10-200 Meters: (Their Most Ambitious Effort.)



Sht. 3

FEDERATED S.W. RECEIVERS

"AIR ROVER" Coil Data:	A	B	C	D
SEC Turns	52	23	11	5
Wire	#29 Enam.	#28	#28	#28
Spacing	.031"	.062"	.093"	.185"
PRI Turns	19	11	9	7
Wire	#30 Enam.	#30	#30	#30
Spacing	.125"	.125"	.125"	.125

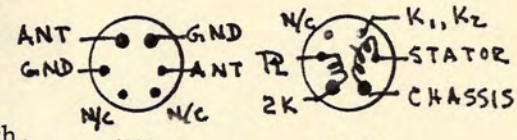
"ARGONAUT" Coil Data:				
SEC Turns	52	23	11	5
Wire	#28 Enam.	#28	#28	#28
Spacing	32 T.P.I.	16 T.P.I.	.093"	.185"
PRI Turns	19	11	9	7
Wire	#28 Enam.	#28	#28	#28
Spacing	Close-Wound	C.W.	C.W.	C.W.

T.P.I. = Turns Per Inch

All coil forms = 1¼" x 21/8" Long.

("VOYAGER" Coil Data Same as "ARGONAUT.)

"VOYAGER" was originally called "ALL-WAVER". This was a regenerative set. If set does not oscillate, reverse connexions at X-X. Standard plug-in coils were used, with a special note on ALDEN coils - i.e., ALDEN coils had to have B+ going to the plate of the detector, and the plate to the RFC.



ANT COIL

GRID COIL

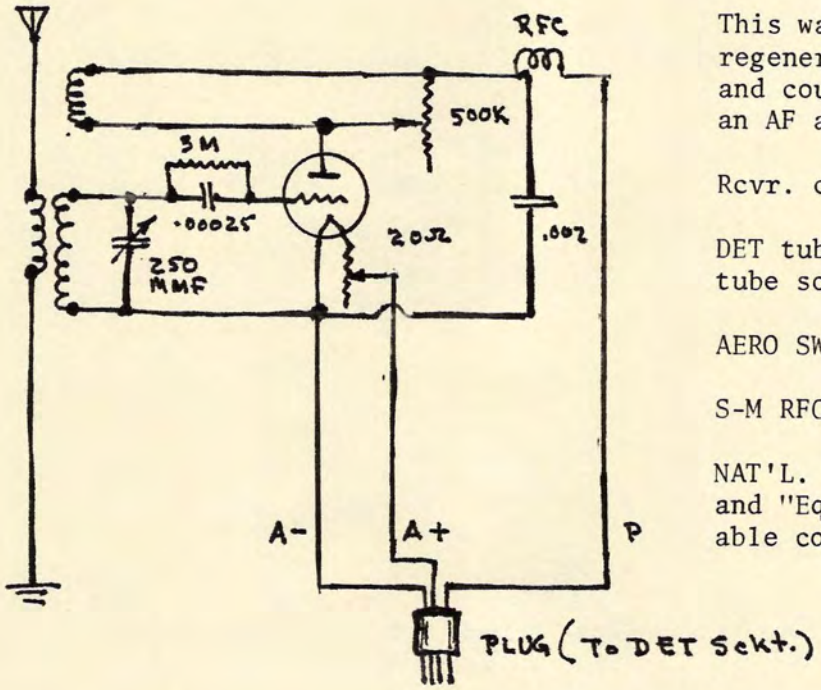
"DISCOVERER" NOTES:
Chassis was steel, 9 3/8" x 11½" x 2" high. Two metal shields were used, 5" x 5", of 20 GA. Top shield was 5" x 11 3/8", also 20 GA. The 25 MMF trimmer had to track with the variable condensers. Dual antenna posts required.

BOTTOM VIEW PLUG-IN COIL

(*)

BARE BUSS-BAR WOUND OVER #18 INSULATED WIRE

GRAFFAM SW. CONVERTER, 1927



This was actually a regenerative SW. rcvr., and could be fed into an AF amplifier, direct.

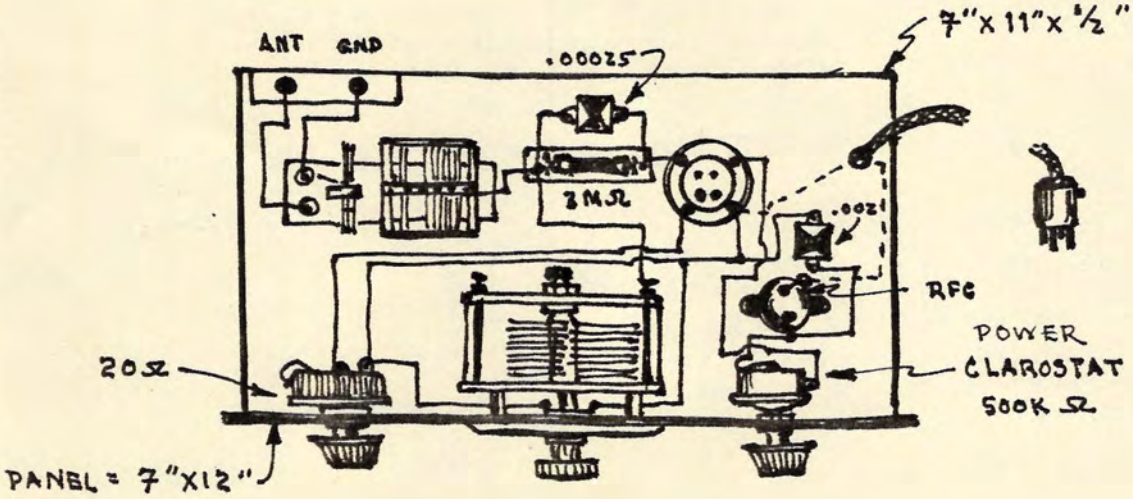
Rcvr. controls not used.

DET tube from rcvr into tube socket of unit.

AERO SW coils used.

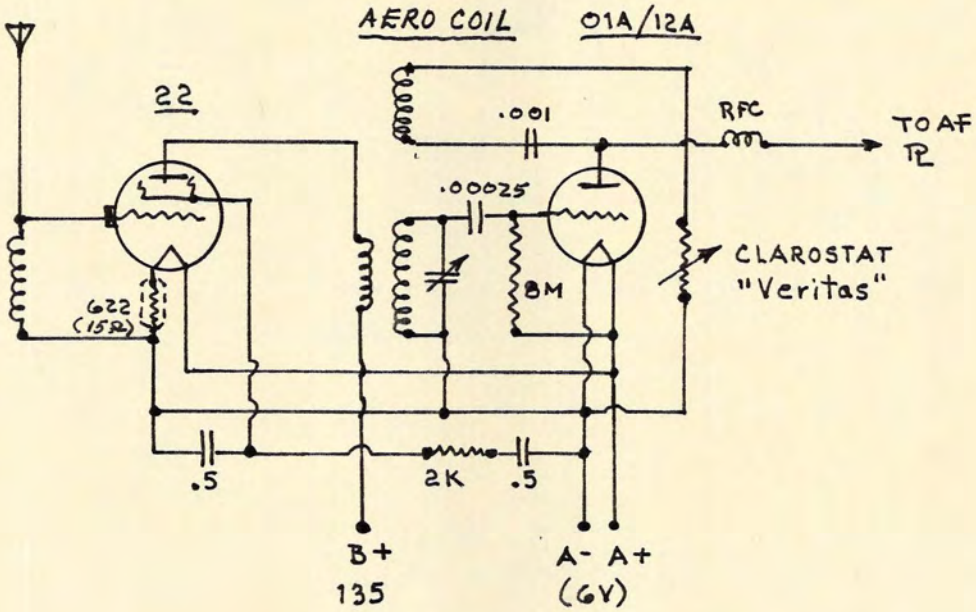
S-M RFC #275.

NAT'L. "C" vernier dial and "Equicycle" variable condenser.



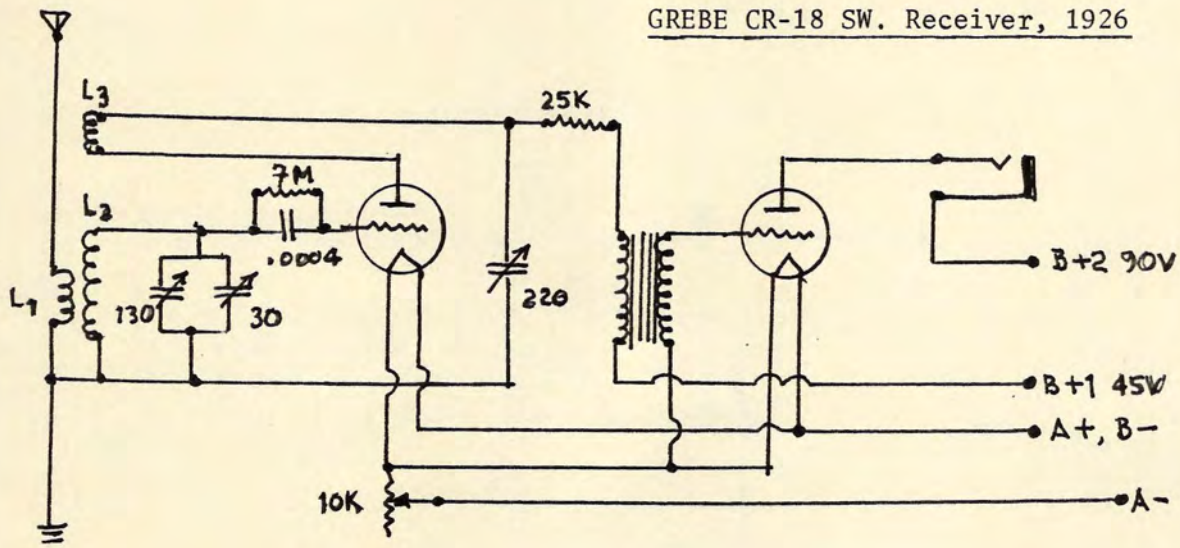
S-M RFC #275 = 100T, #26 DCC, random-wound, ¼" wood spool.

GRAFFAM SHORT-WAVE RCVR. #2, 1928



(To AF Stage)

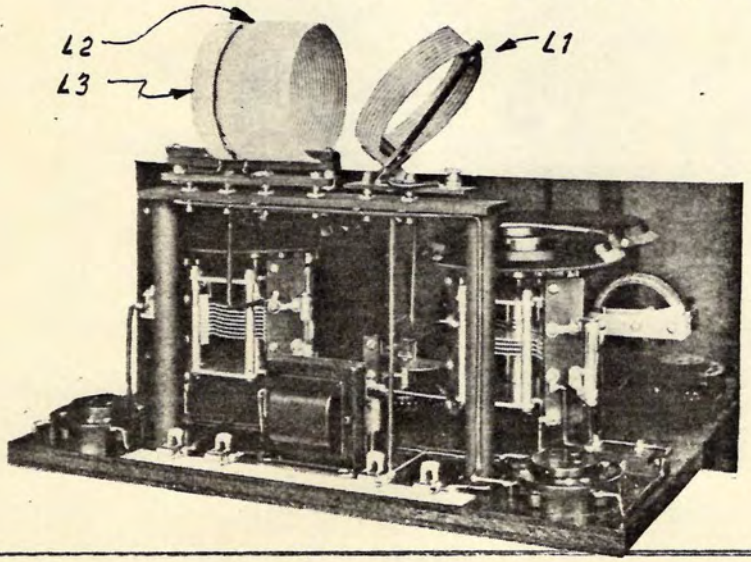
GREBE CR-18 SW. Receiver, 1926



Regeneration is obtained by the throttle method, feedback from the Plate passing through the Plate variable and Plate coupling coil to Filament.

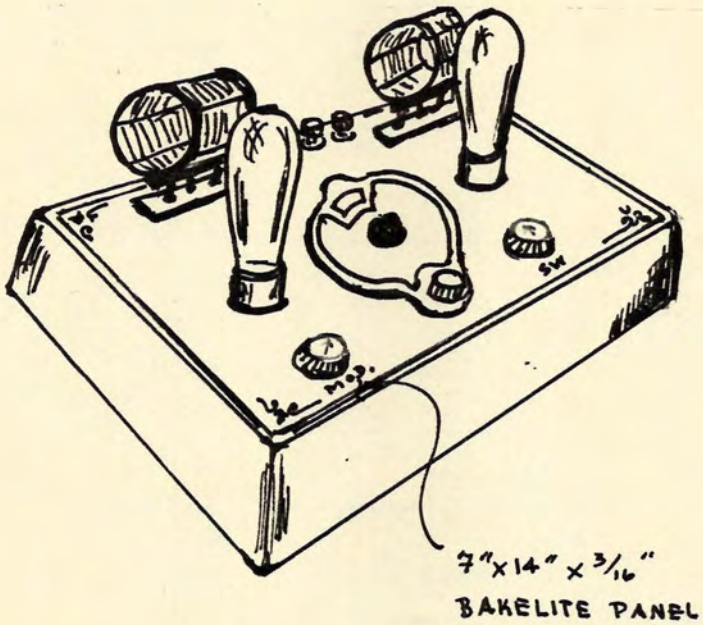
10-215 Meters; SLF Variable; Coils mounted in insulated posts.

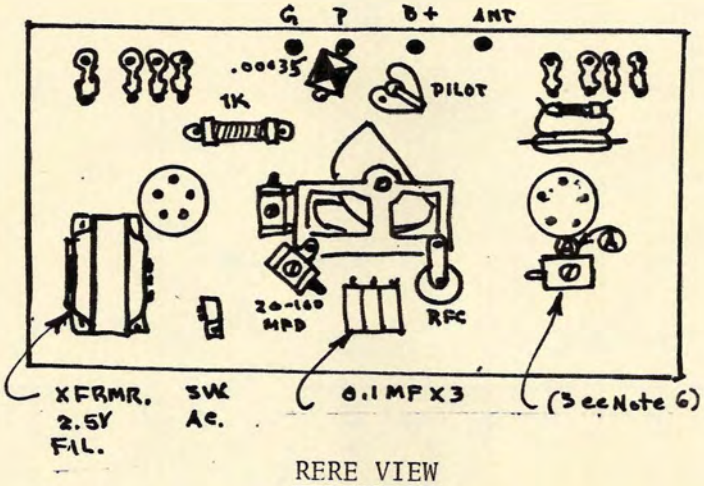
COIL DATA: Coil Forms = 3" Ø "Air-Duc" for all coils.
L1 - 8 Turns per Inch, #16 DCC
L2-L3 = 10 Turns per Inch, #16 DCC.
L2 & L3 wound on same form. (1) L2 - 1T L3 - 2T; (2) L2 - 2T;L3 -2T; (3) L2 - 8T; L3 - 4T; (4) L2 - 18T; L3 - 6T: (5) L2 - 49T; L3 - 18T. All spacing = 1/10th of an inch.



(RN 8-26)

H.B. (*) SW. CONVERTER, 1930: Sht. 1



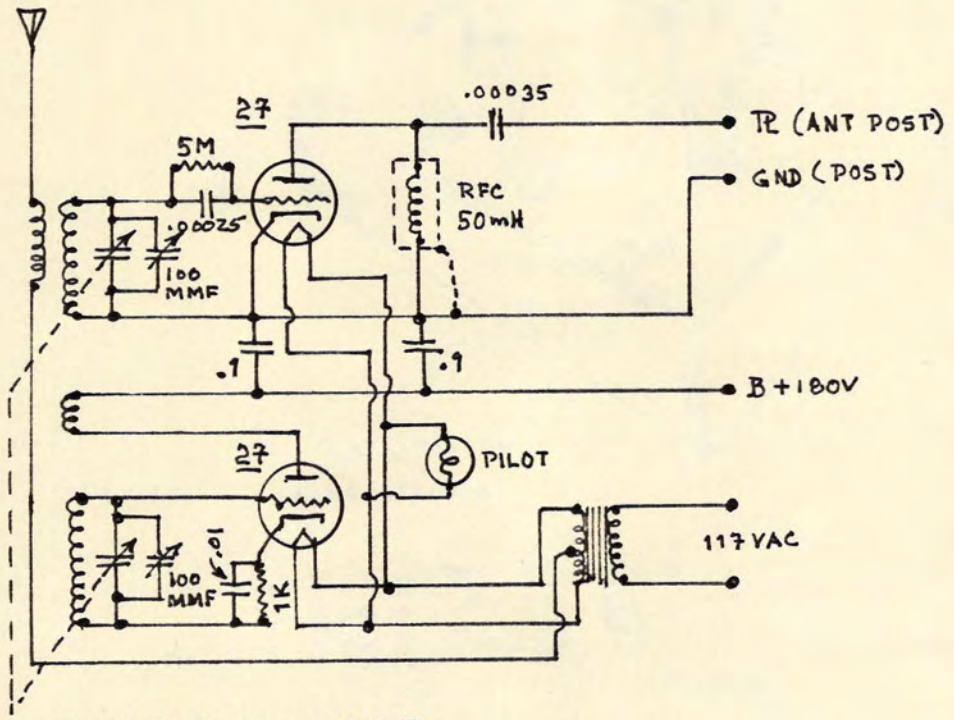


REAR VIEW

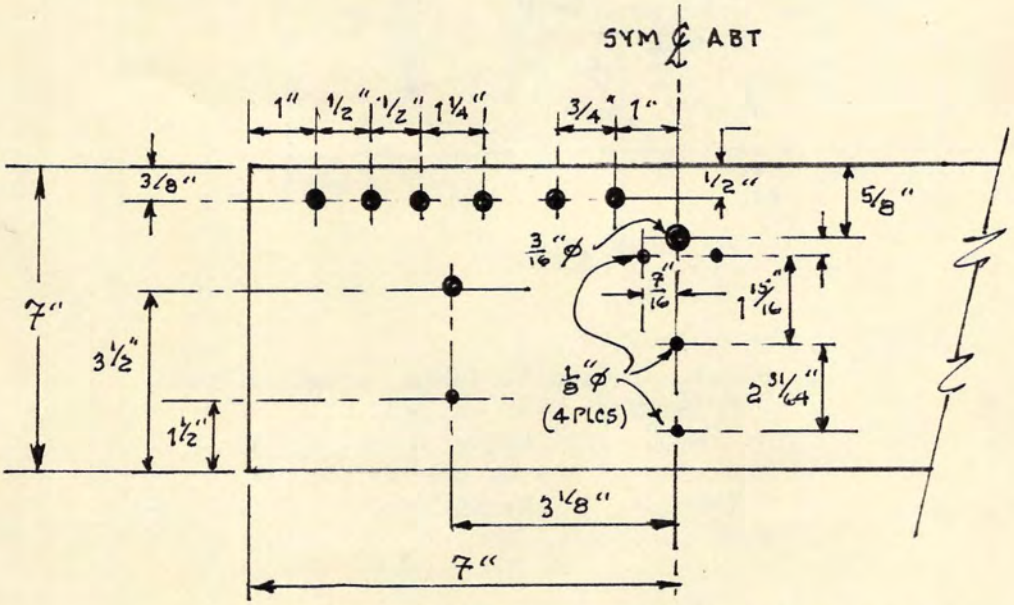
NOTES:
1. RFC was shielded.
2. SCOVILL 2-Gang Variable Condenser used.
3. PRECISION or AERO coils.
4. NATIONAL "VED" Velvet Vernier dial.
5. A.C. switch was of the shaft type.
6. 3/16" bush; ¼" brass shaft 1" longer than bush to engage Modulator trimmer.

(H.B. = Herman Bernard of "Radio World".)

H.B. SW. CONVERTER, 1930: Sht. 2

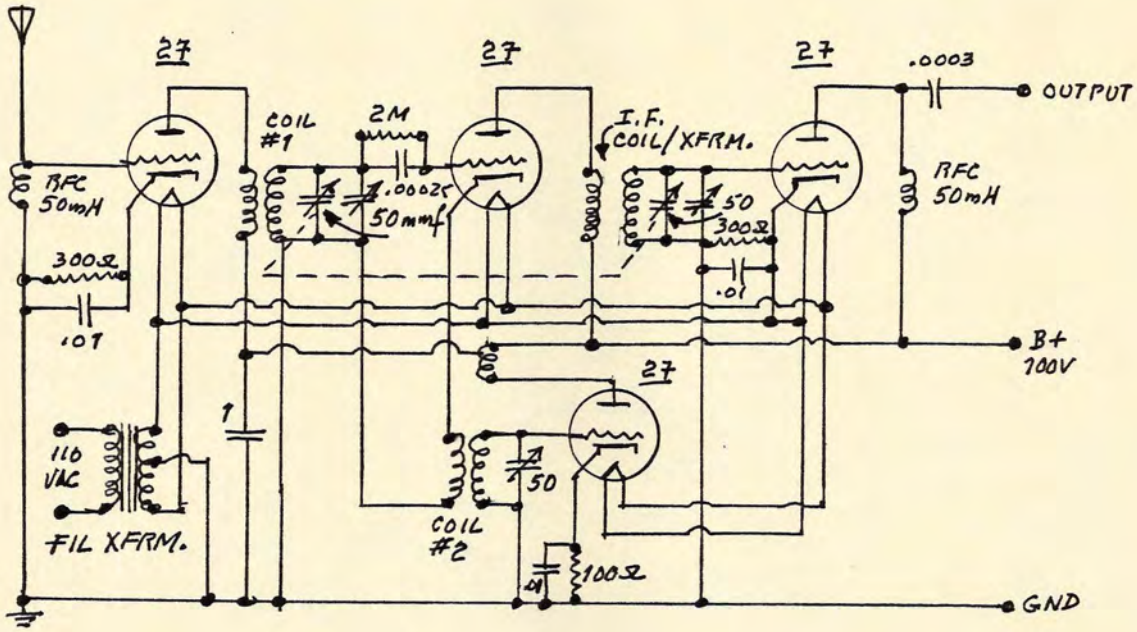


VARIABLES = .0003 MF

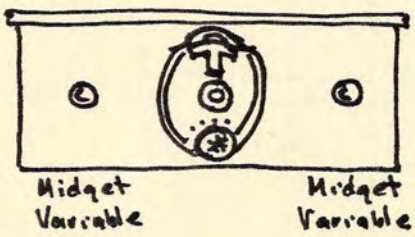


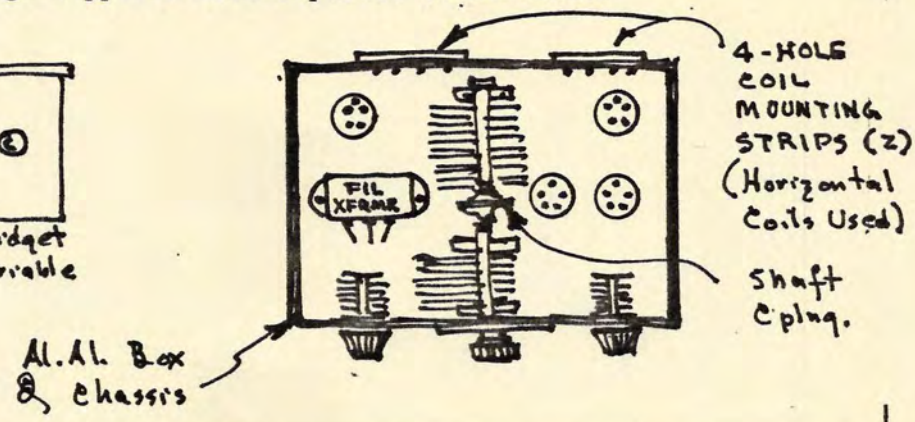
BAKELITE PANEL HOLE PATTERN

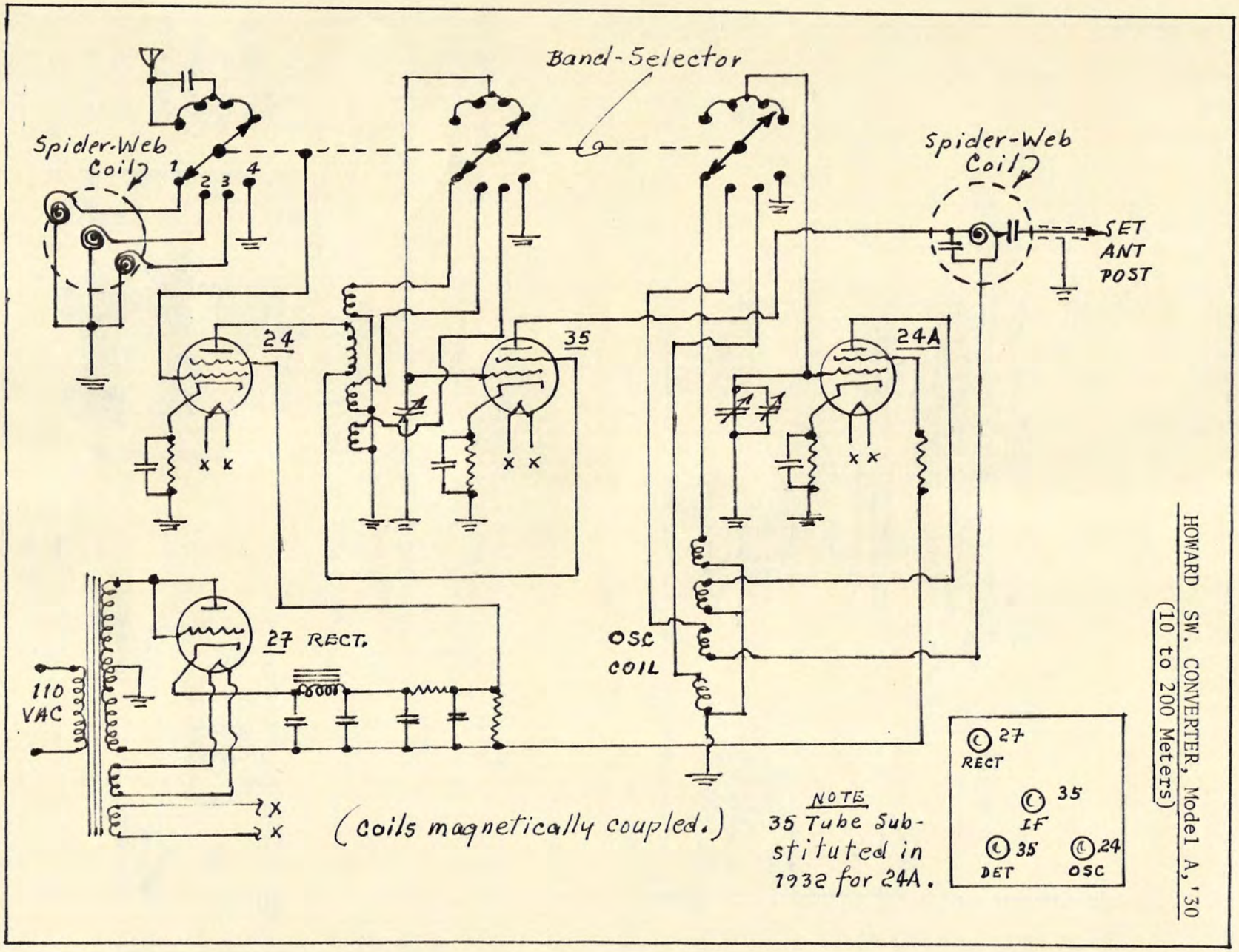
HERMAN SW. CONVERTER, 1930;RW 8-9.



NOTES:
1. IF transformer built-in; IF = 1200/1500 KC.
2. Set receiver dial around 1200 KC; on a signal retune converter.
3. Screen-grid voltage will be sufficient with set volume control placed at MAX at all times.
4. If set is a screen-grid type, grid voltage may be taken from 1st RF tube prong.
5. Converter variable condensers = 250 MMFD.
6. FIL voltage supplied from separate transformer.

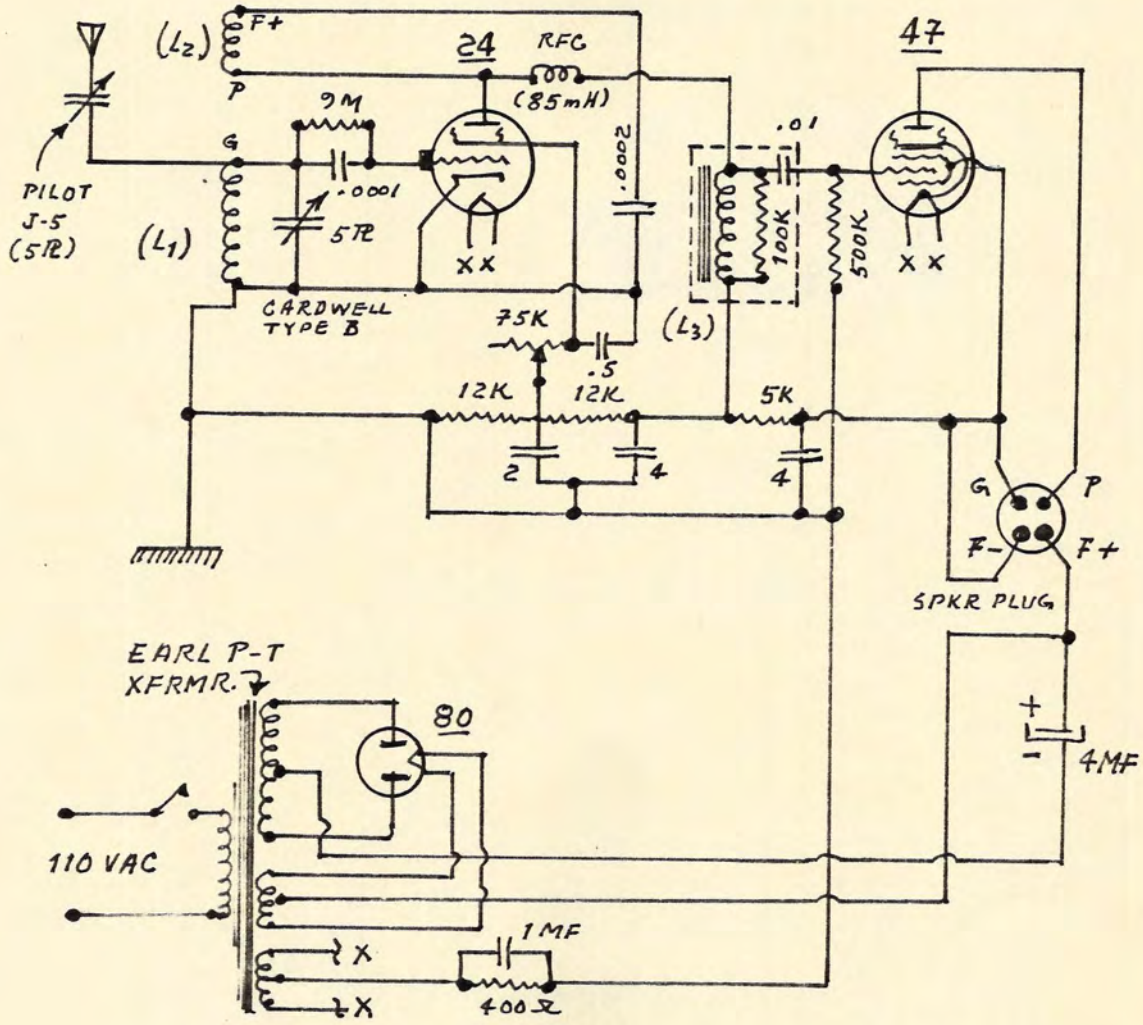






HOWARD SW. CONVERTER, Model A, '30
(10 to 200 Meters)

HENTON SW. PORTABLE, 1931
(Also Known As "ICA Insuline Midget Companion")



85 Meter Band: L1 = 26T, #26 DCC; L2 = 12T, #26 DCC.
40 Meter Band: L1 = 13Tm " ; L2 = 8T, "
160 Meter Band: L1 = 63T, " ; L2 = 30T, "

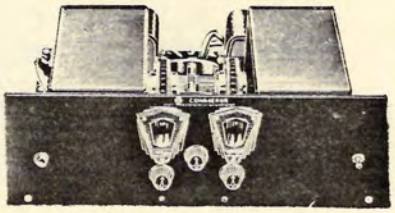
L3 Choke was an Impedance-Coupled unit. All coils wound in same direction.

Original carrying case was 6.5" x 7.5" x 10.37".

(RC-8-'32)

I.C.A. "CONQUEROR" SW. RECEIVER, '30

(Sht. 1)



KNOB DETAIL
(TYP.)

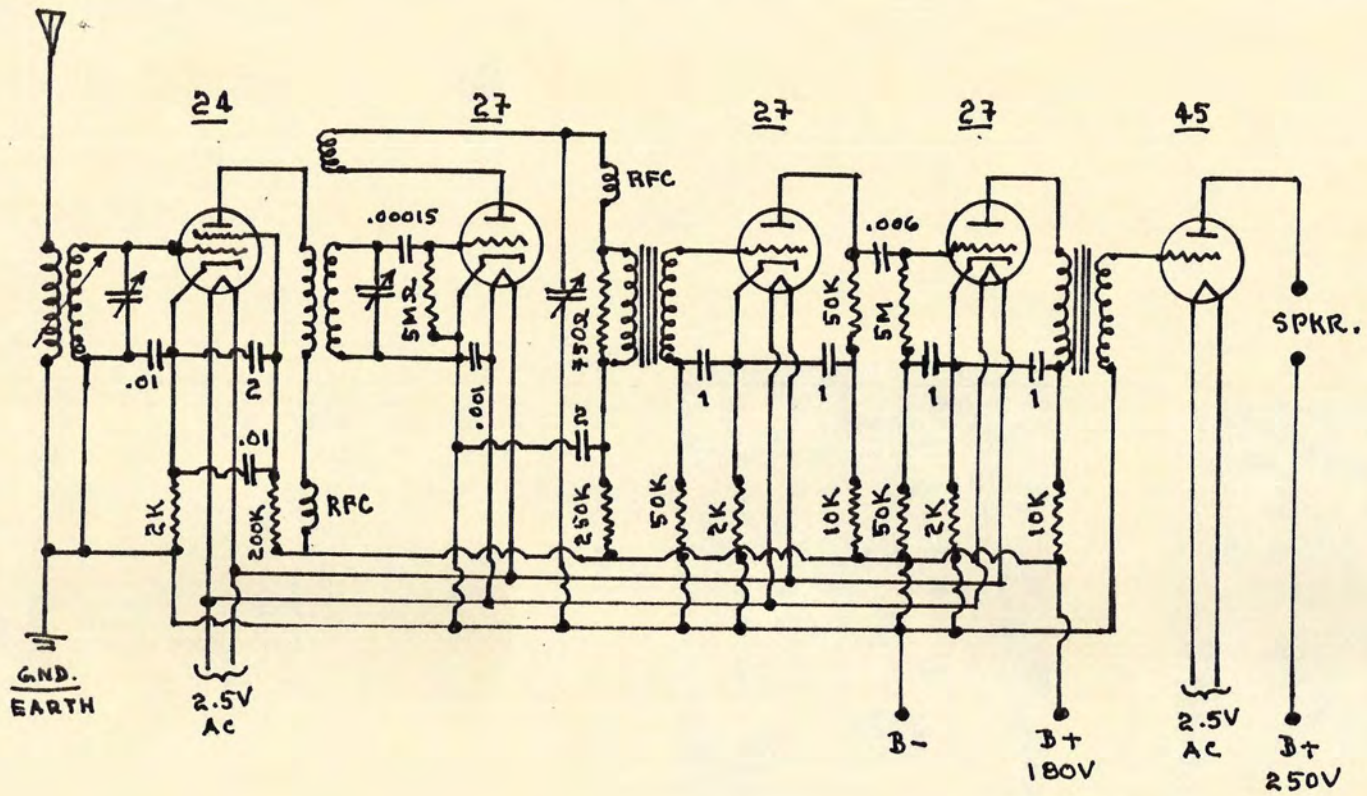
AC or DC models were available at $64.
Screen-grid RF stage & 3 stages of AF - transformer - resistance-coupler - transformer.
Magnetic or dynamic speakers could be used.
The ICA power pack was offered at $35.

NOTE ON THE INSULINE CORPORATION OF AMERICA:

While the "Conqueror" set was ICA's most ambitious effort, their "Mascot" series was very popular, particularly via mail-order from Radio Trading Co., who alternated their emphasis between ICA and Doerle units. The "Mascot" series was offered in 1-2-3-4-5-tube versions. Panel configuration for the 2-3-4--tube versions was identical. The 1 and 5-tube versions were different; the 1-tube version using the same Bakelite cabinet as ICA's SW. converter and their "Pied Piper" crystal sets. The 1 and 2-tube sets were battery-operated; all others were AC, and offered 16 to 200 meters coverage. Aside from the Bakelite cabinetted models, all ICA chassis were offered with a deck and a front panel only. (The ICA was not the same as the ICS.)

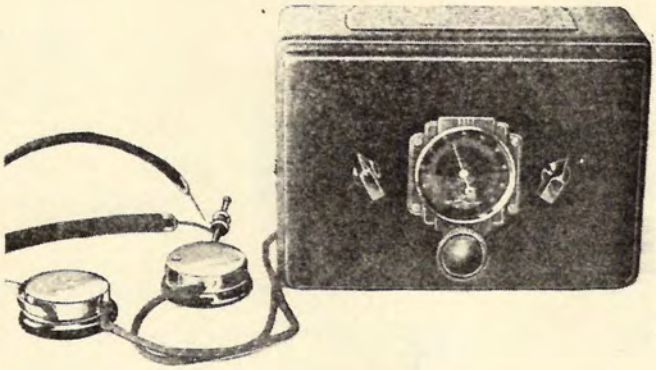
I.C.A. "CONQUERER" SW RECEIVER, 1930

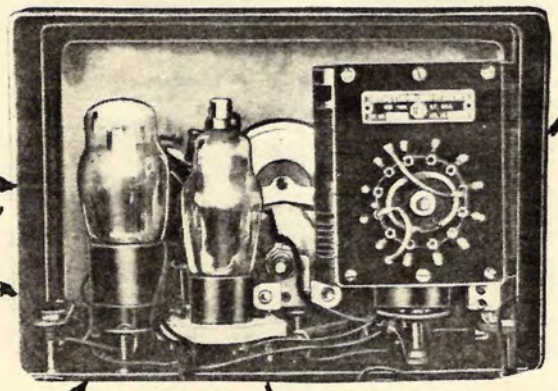
(Sht. 2)



24 Tube was inductively coupled to the DET.
This was originally a kit of pre-wired units, with ICA coils.

ICA 2V BAND-SWITCHING SW. RCVR., 1929/'37
(Sht. 1)





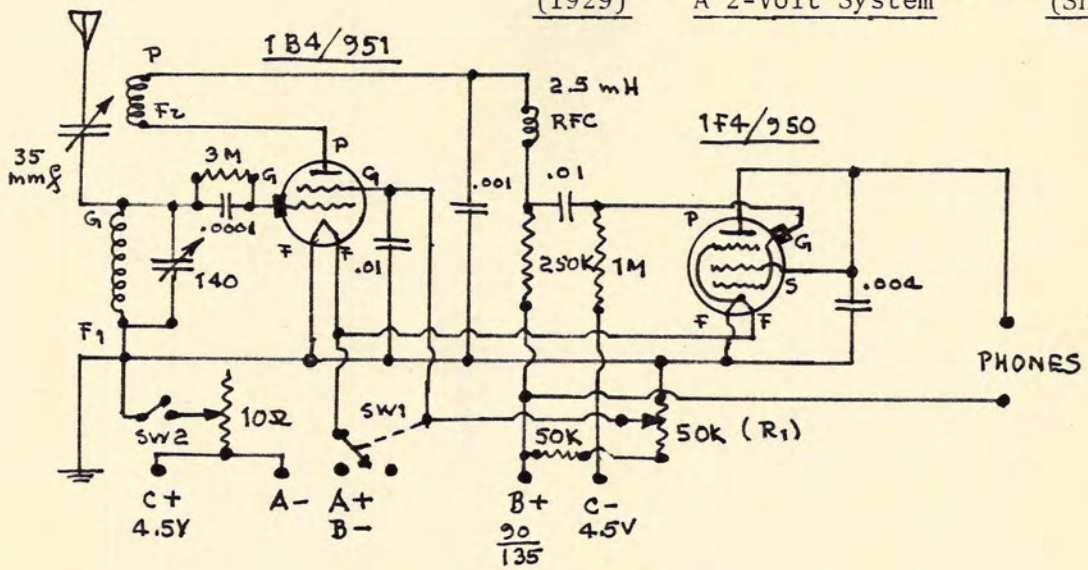
PARTS LIST

140 mmf Variable	RESISTORS
35 mmf Variable	3M-ohms, ½ W.
RFC 2.1/2.3 H	1M-ohms, ½ W
	250K-ohms, 1 W
CONDENSERS	
.0001 .01	Pots/Rheostats
.004 .1	50K-ohms, DPST
.001	10-ohms (FIL)
4-Prong Bakelite Sckt.	90V B-Battery
5-Prong Ceramic Sckt.	(2) 1.5V Dry-Cells

Tubes should be set to a DULL cherry red. 1B4 & 1F4 similar to 32 & 33 Tubes. 1F4 & 950 socket connexions are the same.

(SWC&T 6-37)

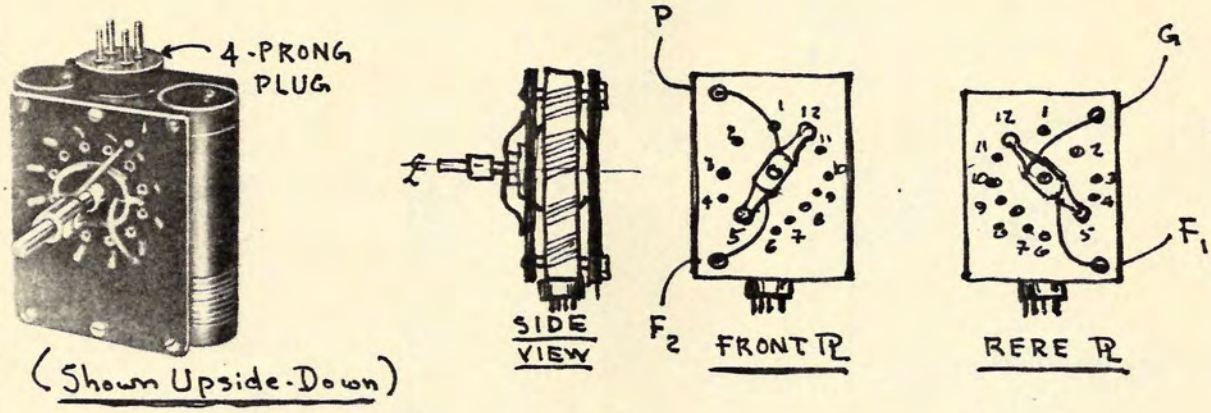
ICA BAND-SWITCHING COIL ASSEMBLY, #1415
(1929) A 2-Volt System (Sht. 2



SW1 ON R1.
HIGH IMPEDANCE PHONES.
AF STAGE MAY BE ADDED.
BAKELITE PANEL.

INSULATED SHAFT TO COIL ASSEMBLY.

(I believe this was a 1937 circuit, but still using the #1415 coil assy.)

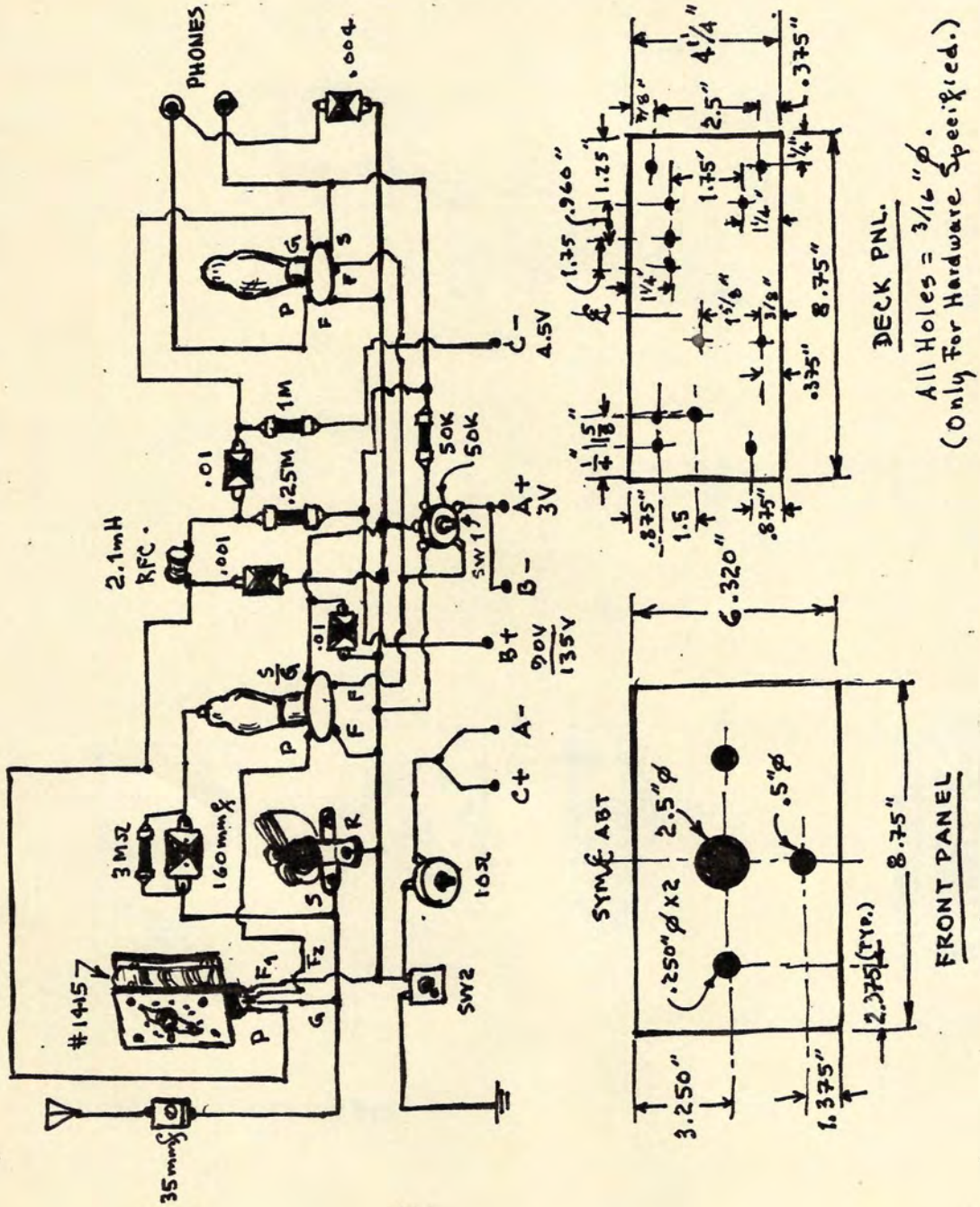


Cabinet = 9.25" x 6.320" x 4.875"
Airplane-type Dial
RFC = 2.1 mH/2.5 mH

"Change-O-Name" Dial Plates
1.125" Pointer Knobs

(SW&T 6-37)

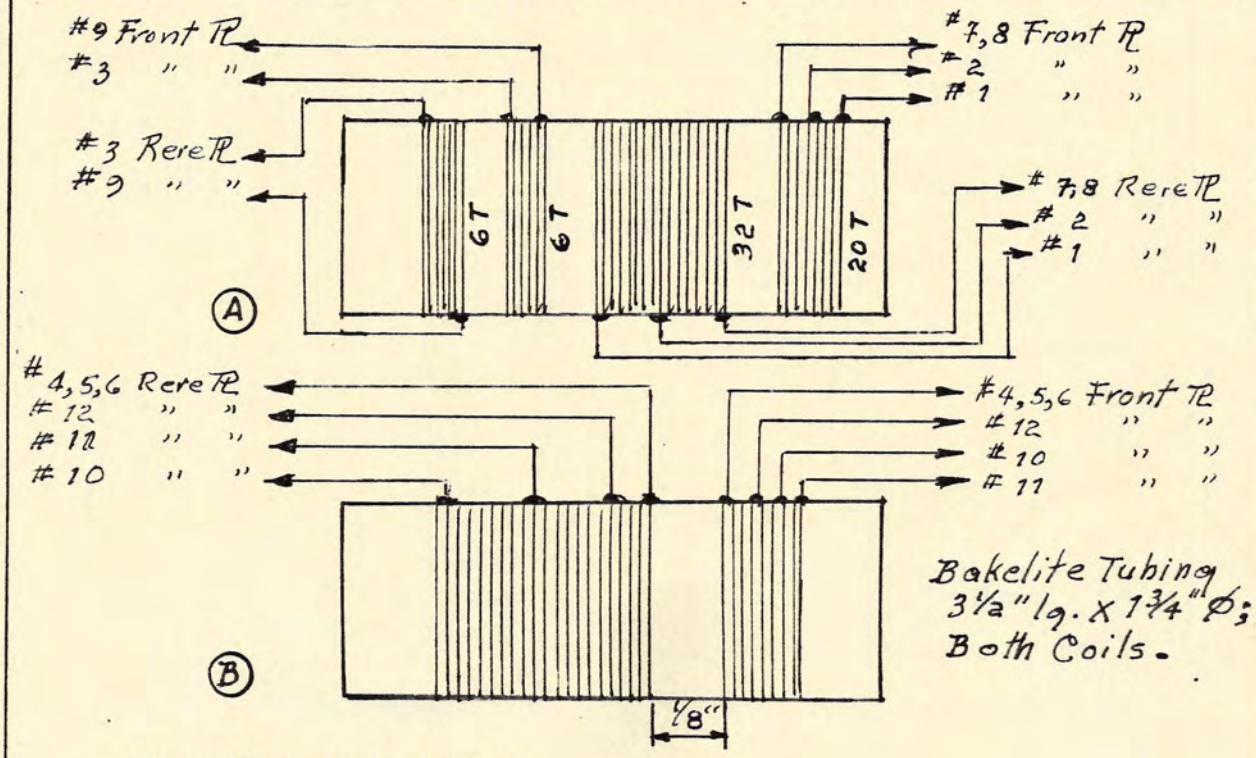
ICA BAND-SWITCHING COIL ASSEMBLY, #1415
(1929) (Sht. 3)



ICA BAND-SWITCHING COIL ASSEMBLY, #1415
(Sht.4)

PRELIMINARY TEST FOR SHORTS:

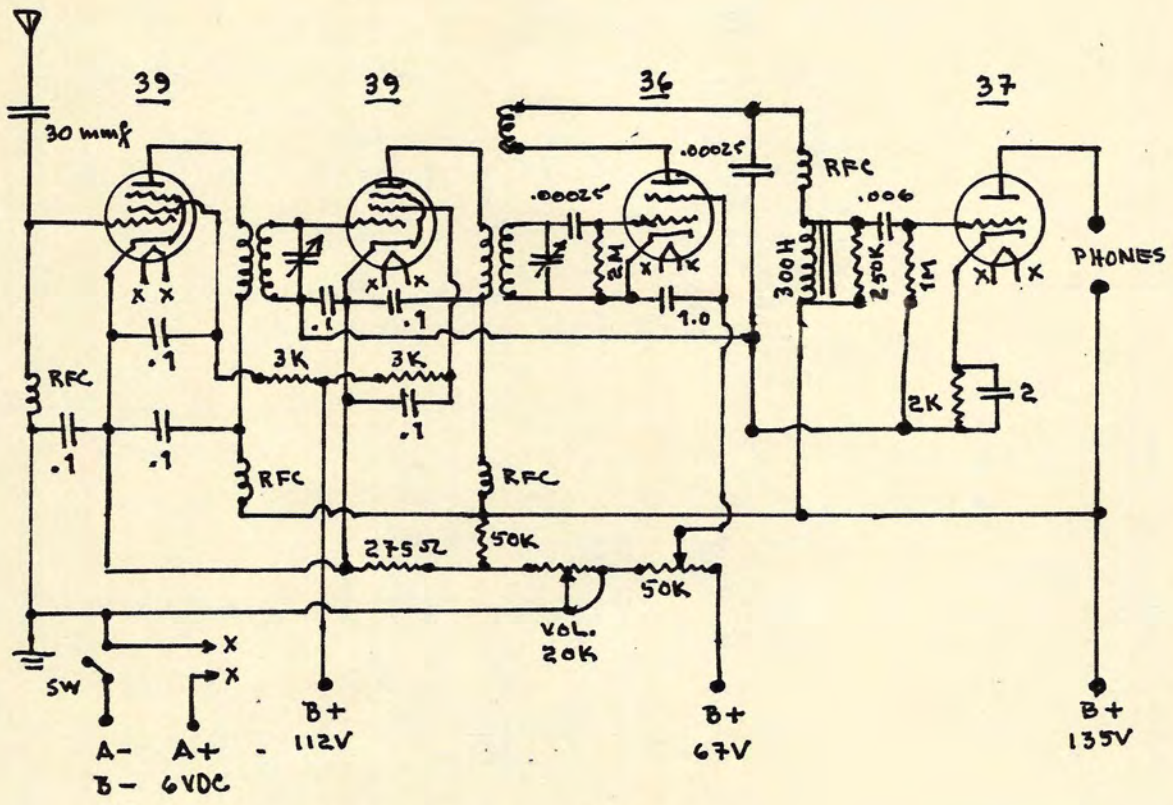
1. Insert coils and tubes; connect 3V "A" power source.
2. Using headphones and a 4.5V "C" battery, test each A+ and C- lead to NEG filament string.
3. Short will cause loud click every time contact is made and broken.
4. No short is indicated by an initial click, but very weak thereafter.
5. Connect "B" and "C" power supplies; adjust 10-ohm rheostat until tubes glow a dull red.



(A) = #22 Enamelled Wire.
(B) = #30 Cotton/Silk Covered Wire.

Spacing between windings on (A) from left=hand end = ¼"/¼"/9/16"/3/16"

I.C.S. SHORT-WAVE RECEIVER, 1934

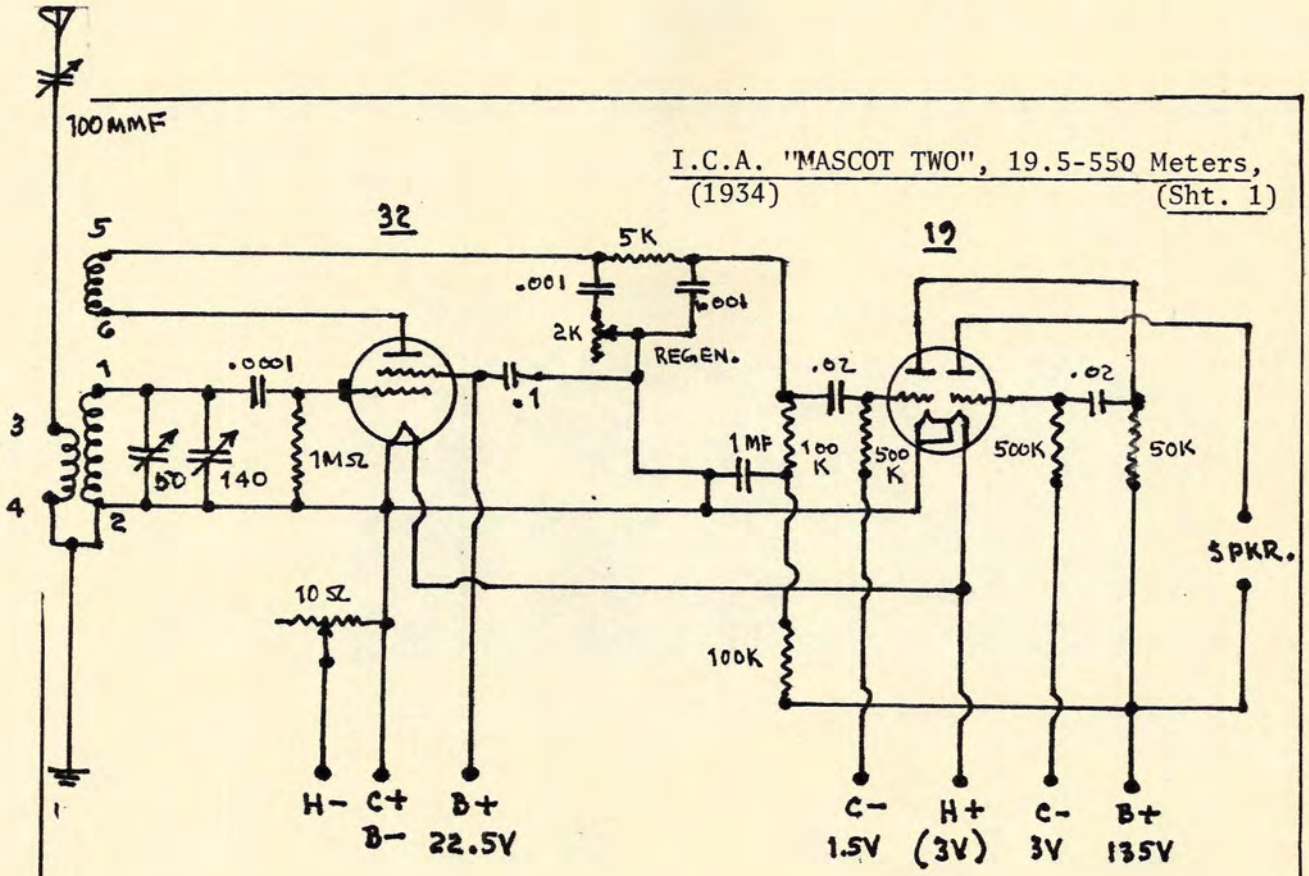


(3) RFC = 10 - 50 mH EACH.
OUTPUT CHOKE = 300H. (*)
(6) .1MF FIXED CAPS.
(2) .00025 " "
1.0 MF " "
2 MF " "

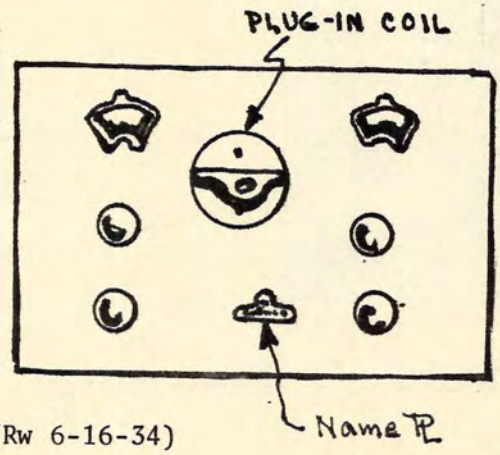
1 MΩ 275Ω
250KΩ 20K POT.
2 MΩ (2) 3K Ω
(2) 50K - FIXED & POT.
(*) = IMPEDANCE CPLD.

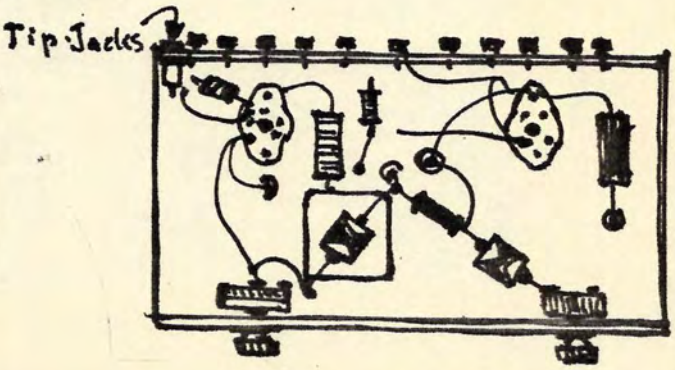
NOTES:
1. Shield all tubes, coils, and RF wiring.
2. Type 38 tube may be added for 2nd AF stage.
3. Any standard set of coils and variables may be used.
4. 20K pot. varies control-bias on 39 tubes.

I.C.A. "MASCOT TWO", 19.5-550 Meters, (1934) (Sht. 1)



1 SET I.C.A. 6-PRONG COILS.
50 & 140 mmf VARIABLES.
COIL SHIELD CAN w/ 6-CONTACT SCKT.
2 DIAL DRIVE ASSY. w/ SCALES.
METAL PANEL & SUB-PANEL.
9 BINDING POSTS + SPKR. TIP-JACKS.

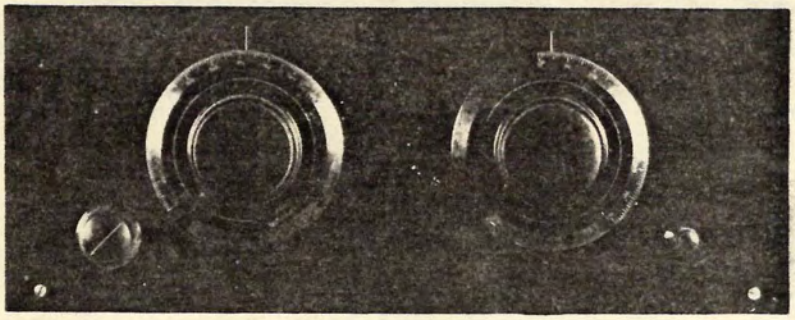


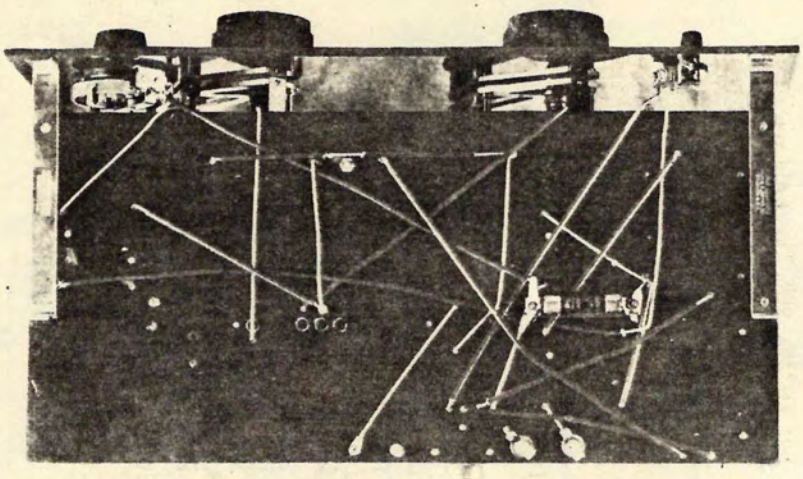


PARTIAL BOTTOM VIEW

(Rw 6-16-34)

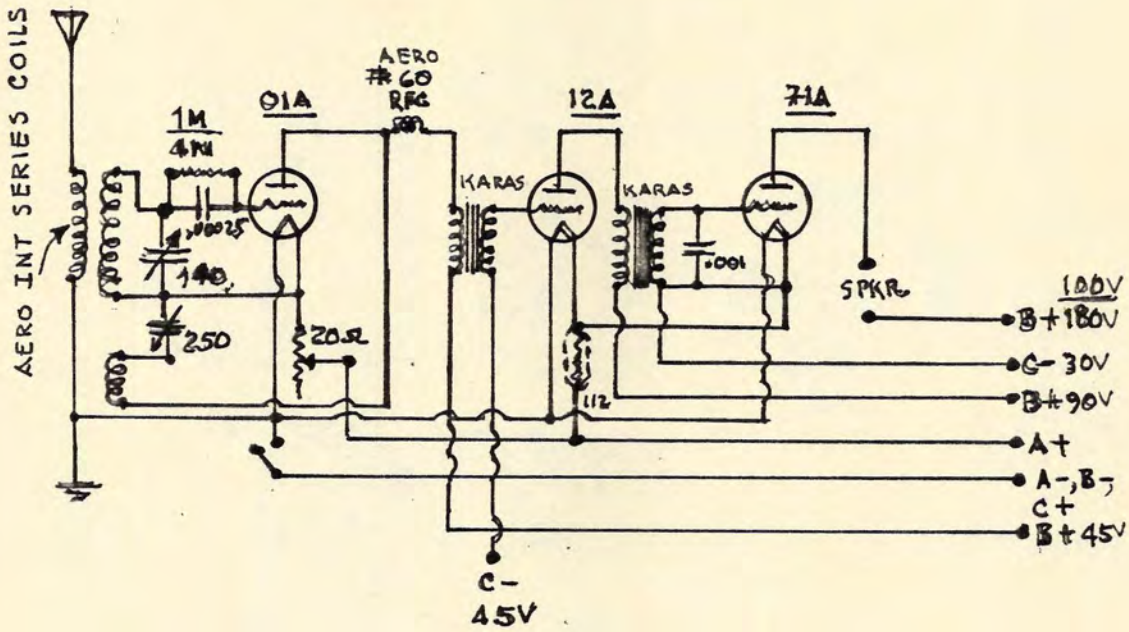
KARAS SHORT-WAVE RECEIVER, 1927





BOTTOM VIEW

KARAS "ROUND-THE-WORLD-FOUR" SW SET
(1927) (Name Also Used By S-M) Sht.1

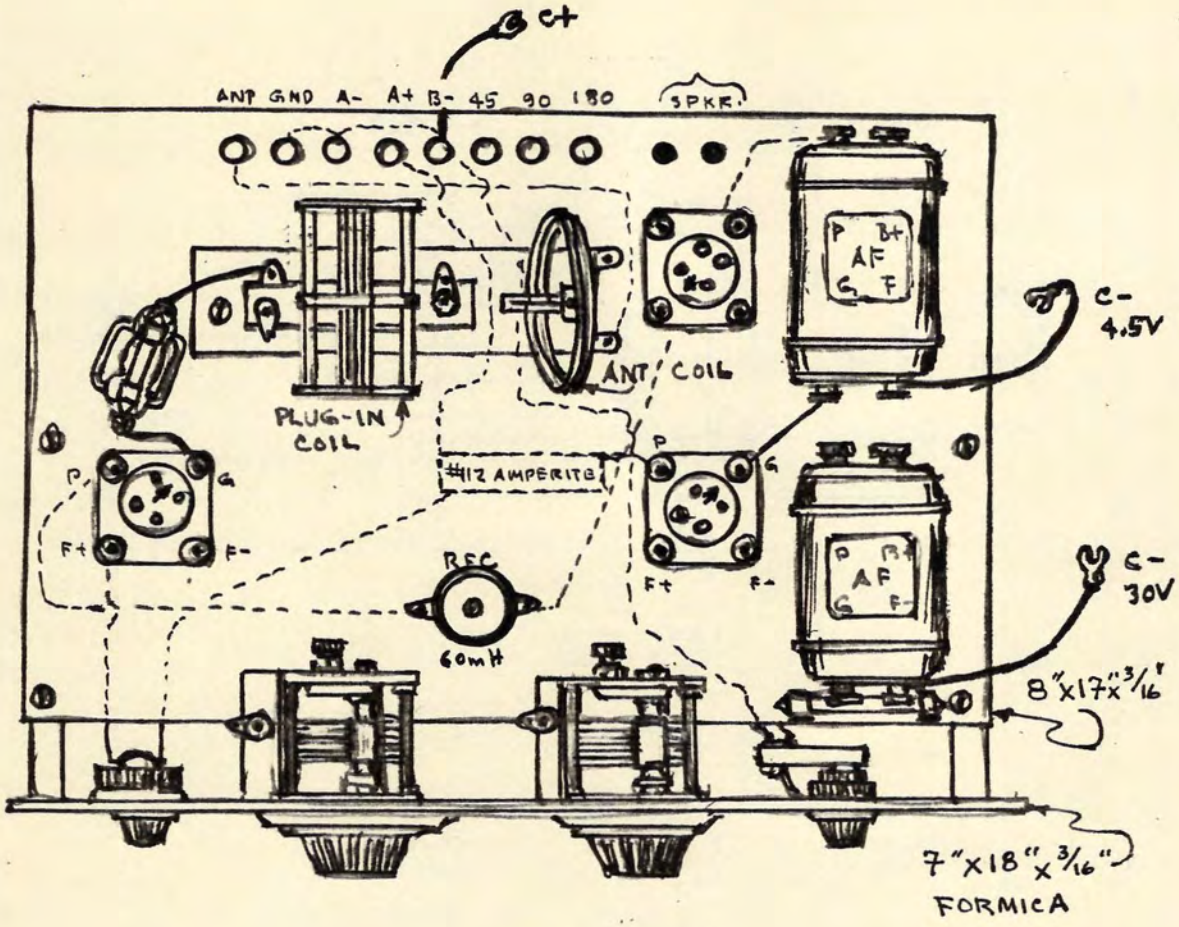


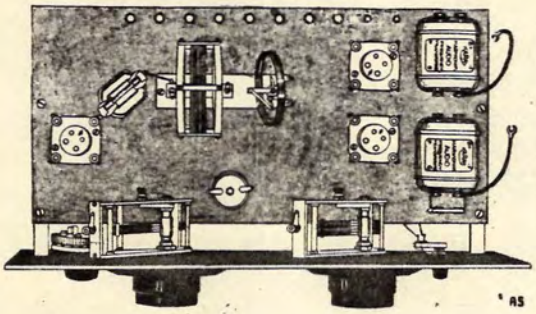
GENERAL NOTES

1. Inductances should be kept well back from variables and AF xfrmrs.; well to the left.
2. No metal near coils or the 140 MMF variable.
3. Point of oscillation is recognized by a soft click while rotating the 140 variable. Always hover around the point of click for greatest sensitivity; rotating tuner beyond this point will induce an acoustic howling.
4. Rock the 250 MMF variable over signal, and follow-up with the 140 variable.
5. A filter between the 71A and speaker is optional.
6. RFC = 85 mH: 150 mH may be substituted.
7. If circuit oscillates at all frequencies, omit the 250 MMF variable.
8. Karas AF xfrmrs. = "Harmonik".
9. Panel = 7" x 18" Baseboard = 8" x 17" x 3/16"
10. Baseboard was actually a sub-panel of Bakelite, placed on (2) Benjamin brackets.
11. FIL switch was Yaxley #10.
12. Karas kit sold originally for $58.

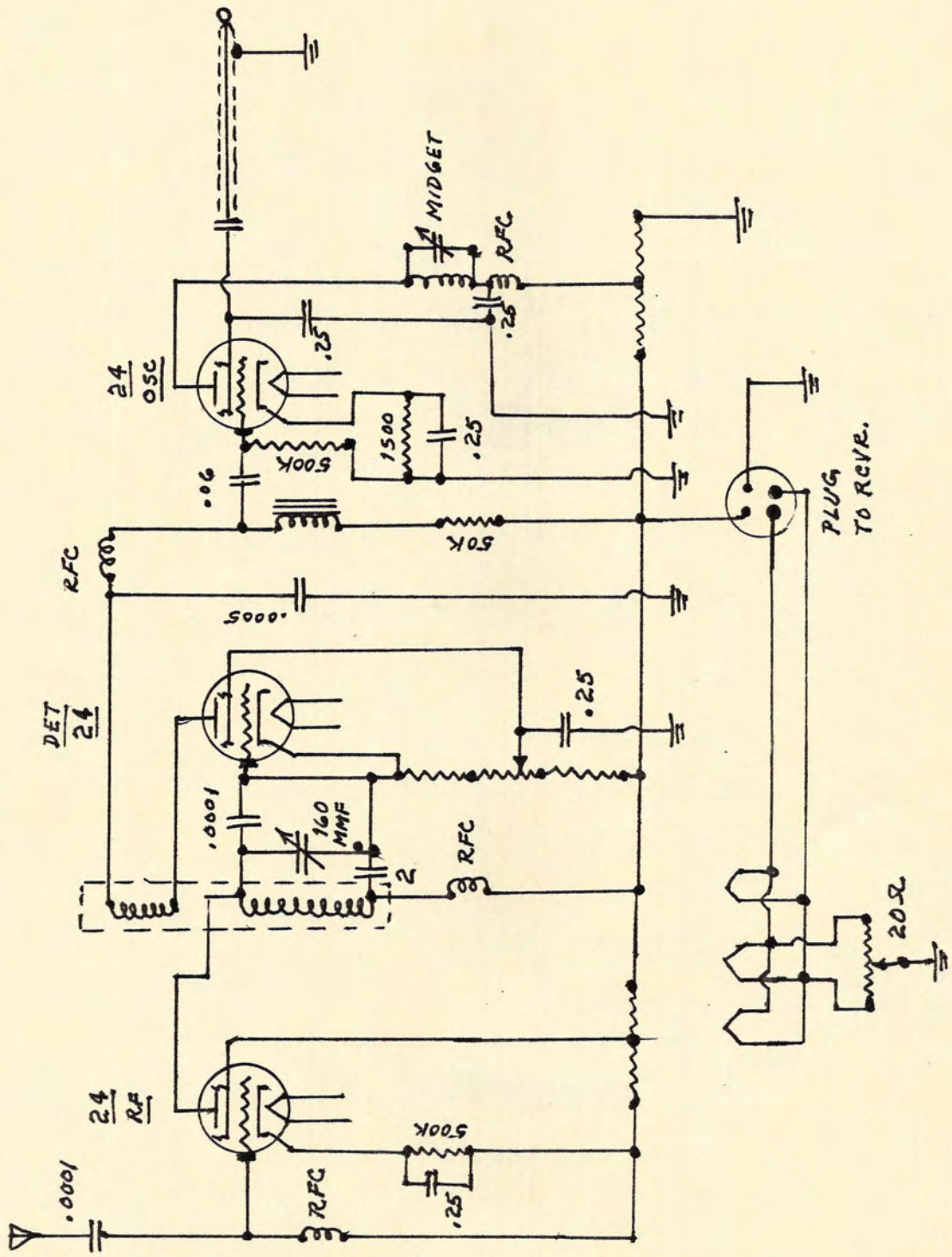
(RE 11-28)

KARAS SHORT-WAVE RECEIVER, 1927;Sht.2

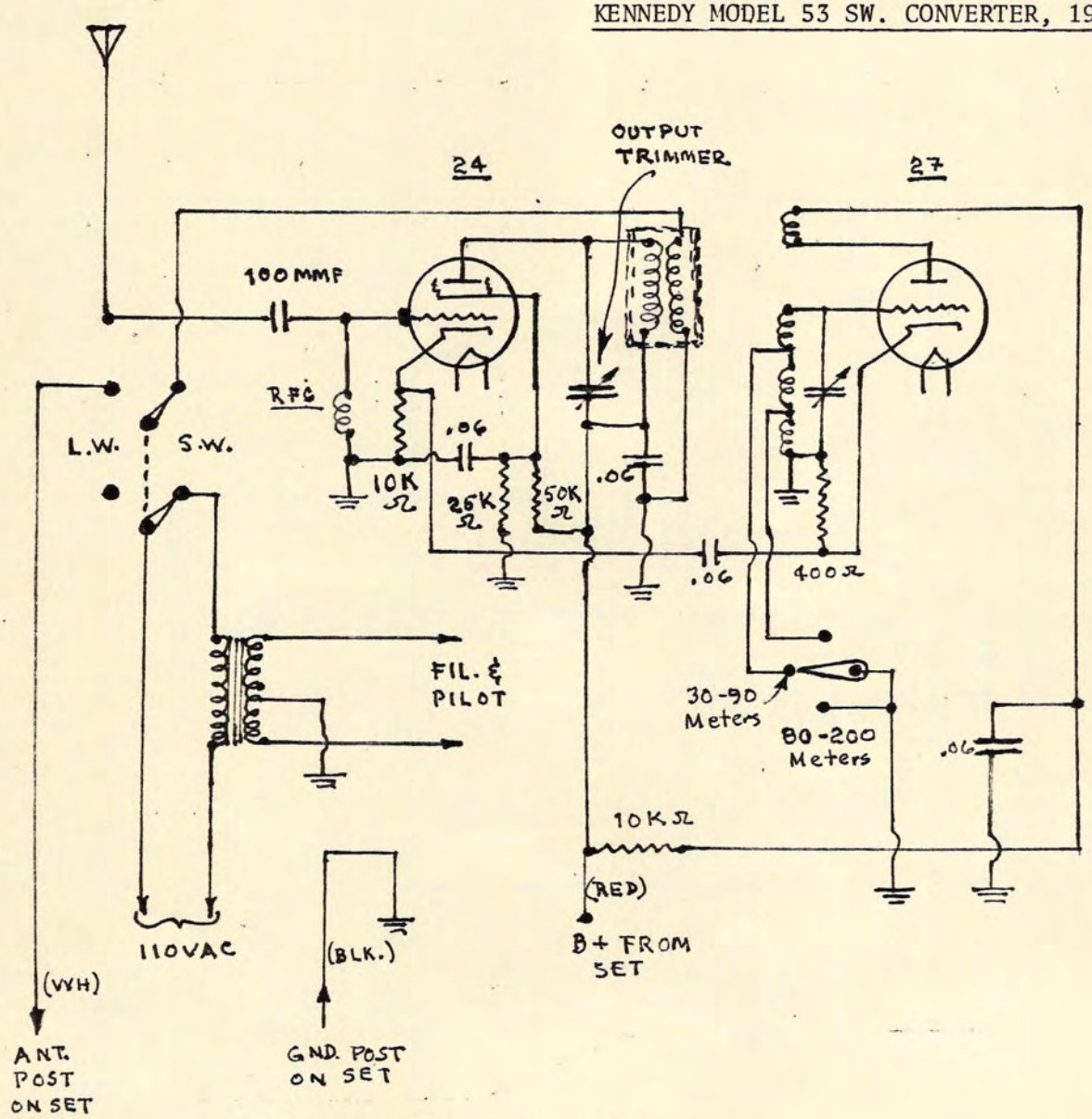




KENNEDY SW CONVERTER, Model 34; 1929

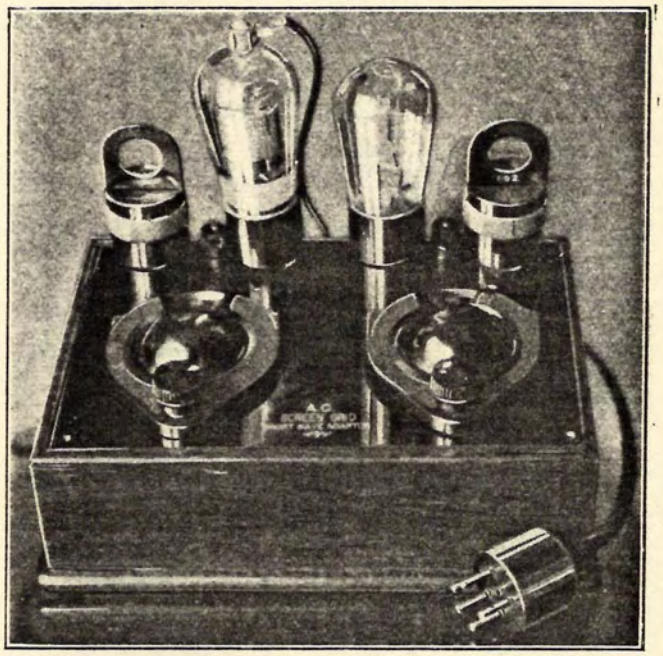


KENNEDY MODEL 53 SW. CONVERTER, 1932



RF Transformer = 1,000 KC.
Set receiver dial at 1,000.
Red lead connected to speaker or filter system;
any voltage from 150 VDC to 250 VDC is suitable.

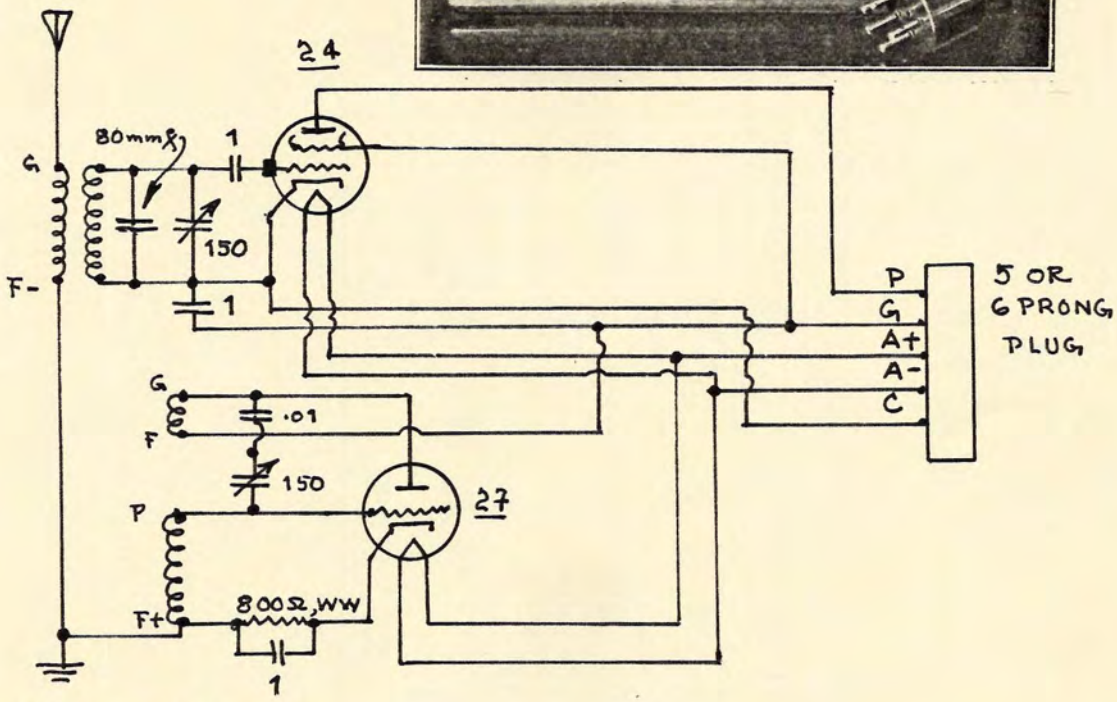
KING A.C. SCREEN-GRID SW. ADAPTER



AIR KING COILS

($17.50)

1930

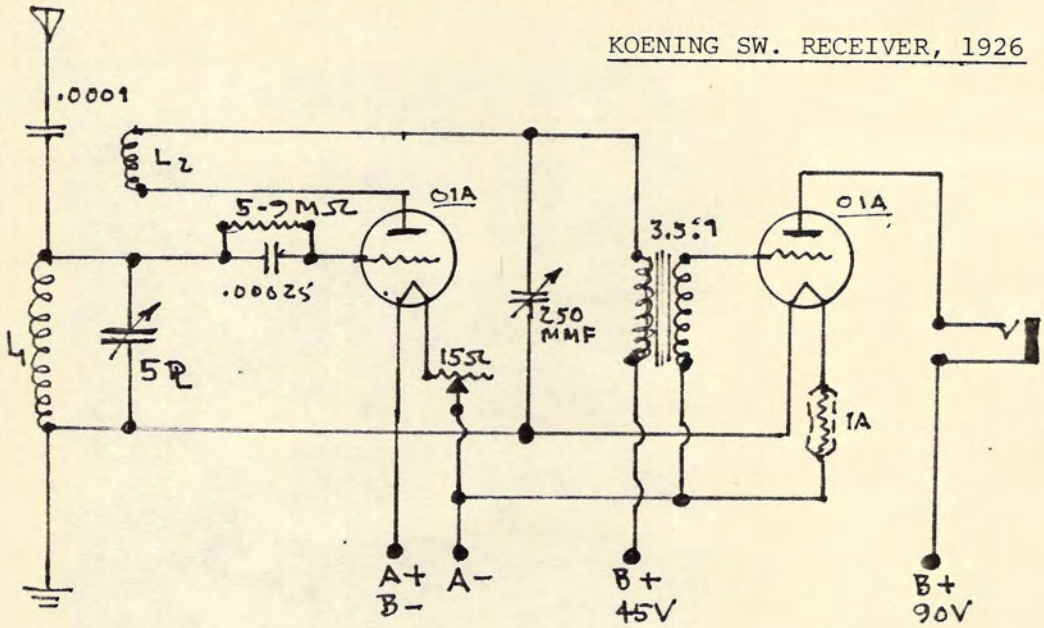


(RW 3-1-30)

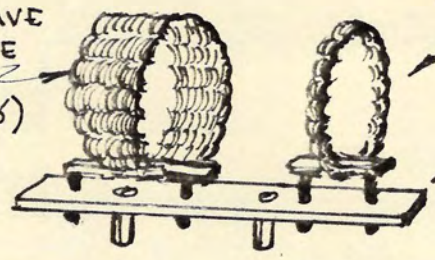
NOTE: This adapter can be used only with A.C. TRF's that employ a 24 tube as the 1st AF amplifier; taken from set and installed in unit. Coils must not be more than 7" apart.

(RW-3-1-30)

KOENING SW. RECEIVER, 1926



L1 ~ PLUG-IN BASKET-WEAVE LORENZ-TYPE COILS. (#16 DCC, 3"ϕ)



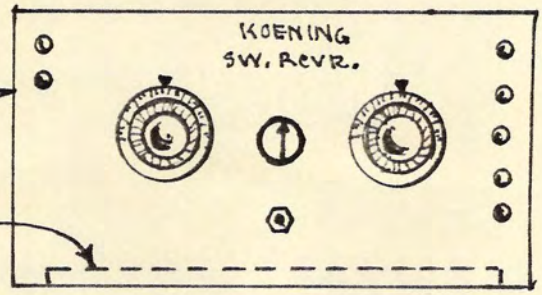
L2 = FIXED COIL

RADION COIL BASE

L1 COIL DATA

	Grid	TP
20 Meters	3T	4T
40 "	8T	5T
80 "	18T	10T

G/L May Be Variable For Oscillation on All Wave-Lengths.

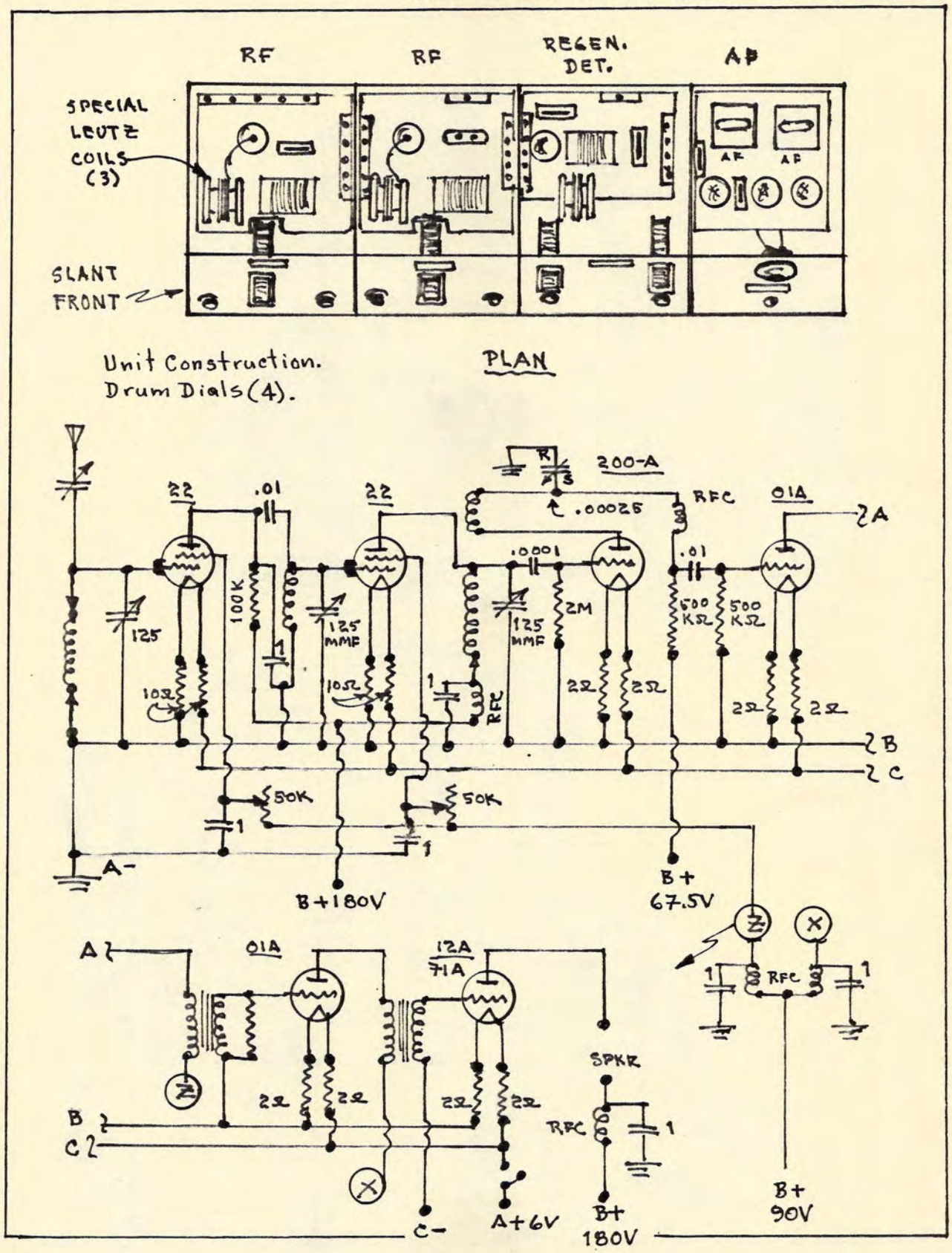


7"x14"

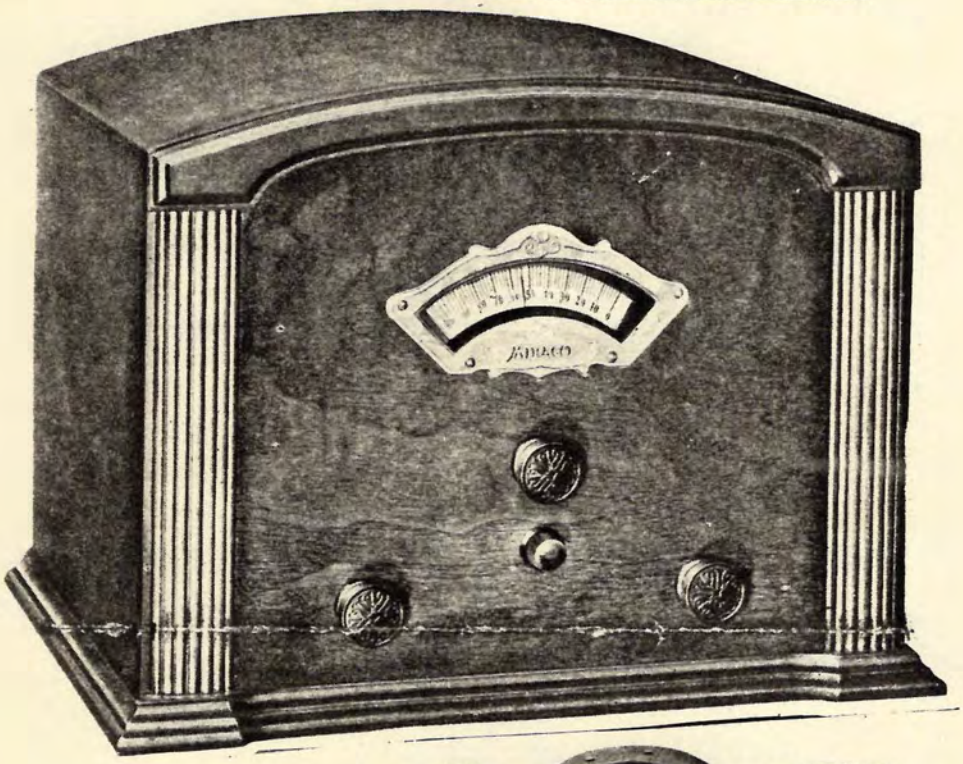
7"x13"x1/2"

(CB 6-26)

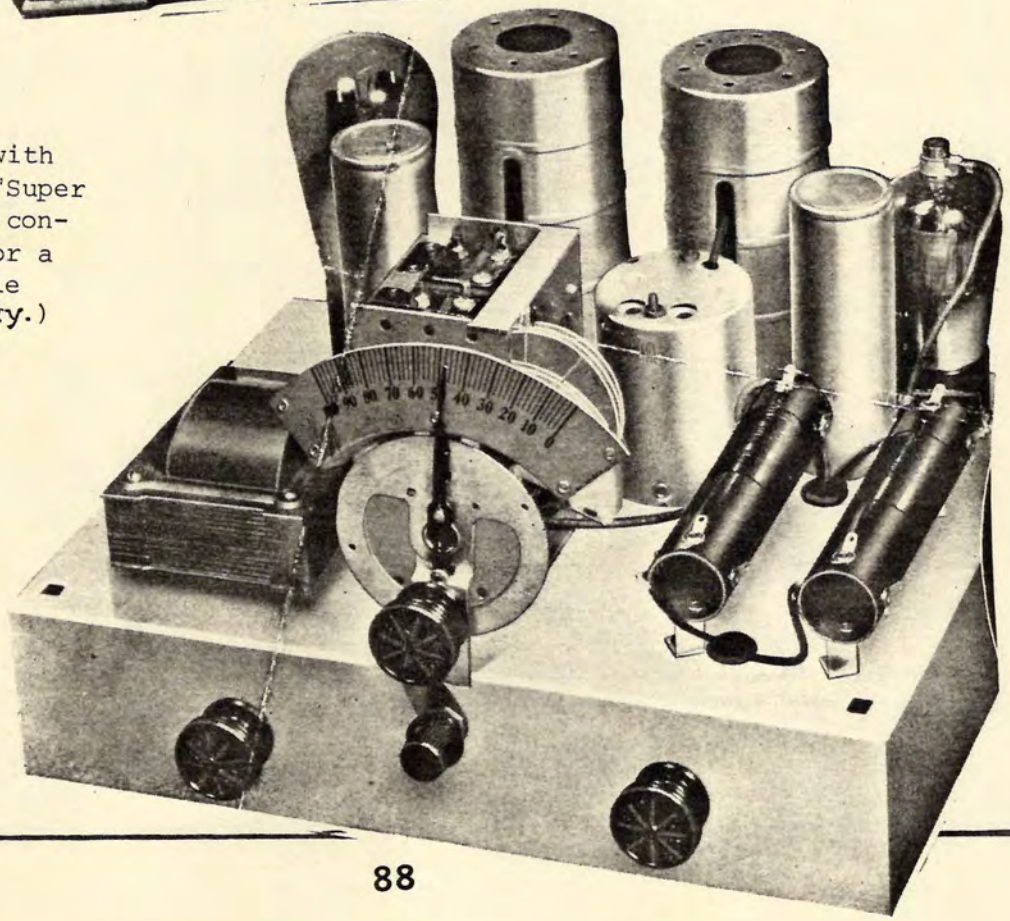
LEUTZ MODEL-C SW. RCVR., 1929: 15-200 Meters



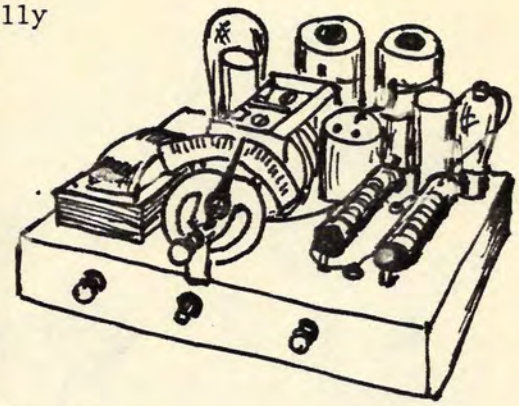
MID-WEST SW SUPER-HET CONVERTER, C-4



(Compare with PILOT's "Super Wasp" SW converter for a remarkable similarity.)



MID-WEST SW. CONVERTERS, Models C-4 & Z-4, 1932

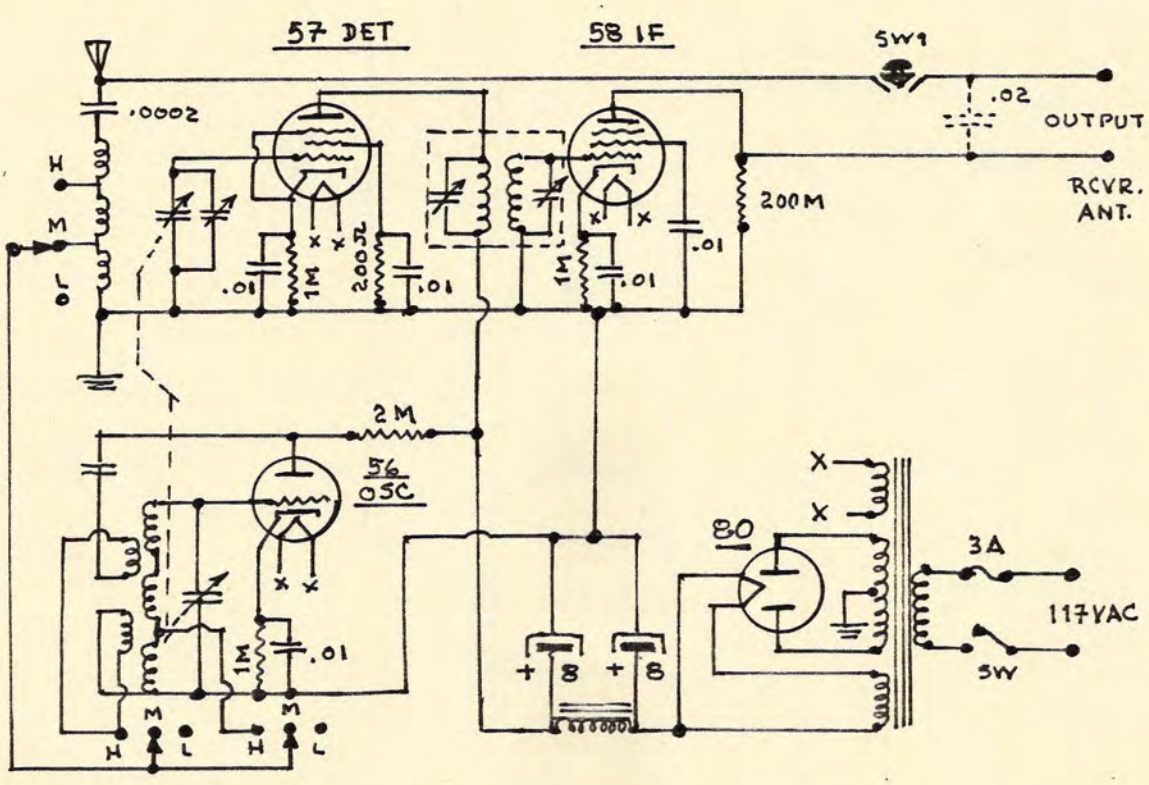


These two models were essentially the same, the major difference being in the tube complement: e.g., the C-4 used an 80, 56, 57, 58; the Z-4 utilised an 80, 27, and (2) 24As.

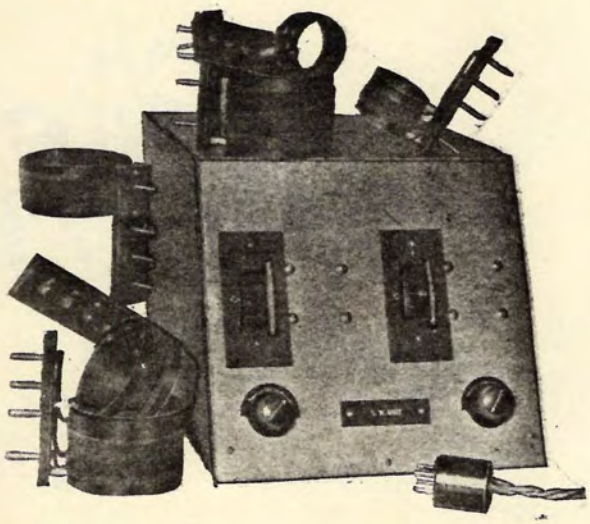
The IF was 560 KC for both, and both had a non-regenerative detector.

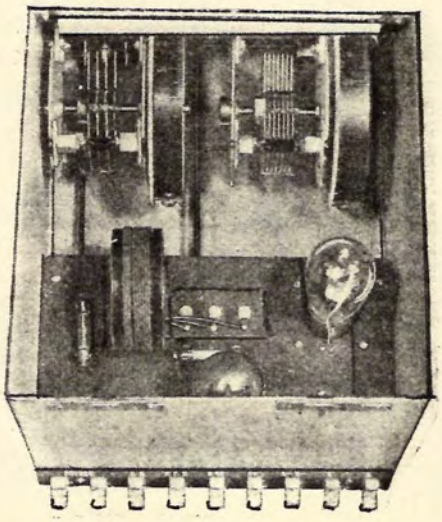
Both used a 2-gang variable condenser bank, a 3-position 3-deck rotary switch, and a switch for cutting the converter in or out. Output cable was shielded, and an .02 MFD capacitor at the output of the converter was optional. Vernier dials had a ratio of 6:1.

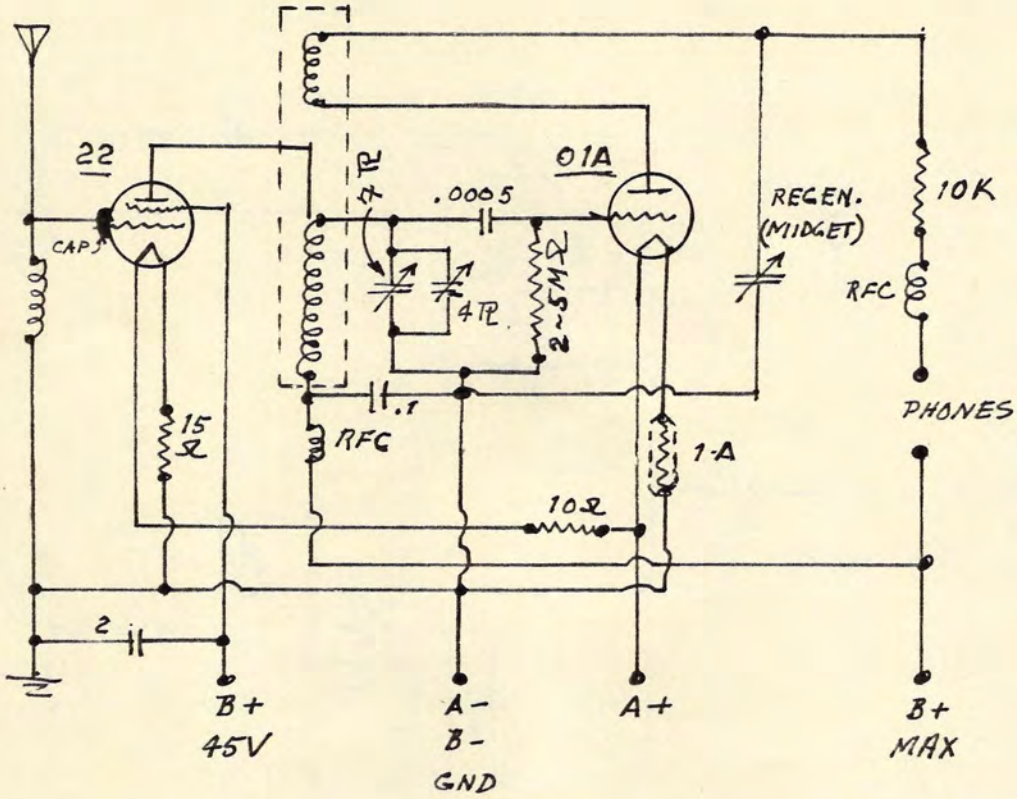
The physical configuration of both units was identical, except for the shape of the electrolytics.



LEUTZ SW ADAPTER/RECEIVER, 1929

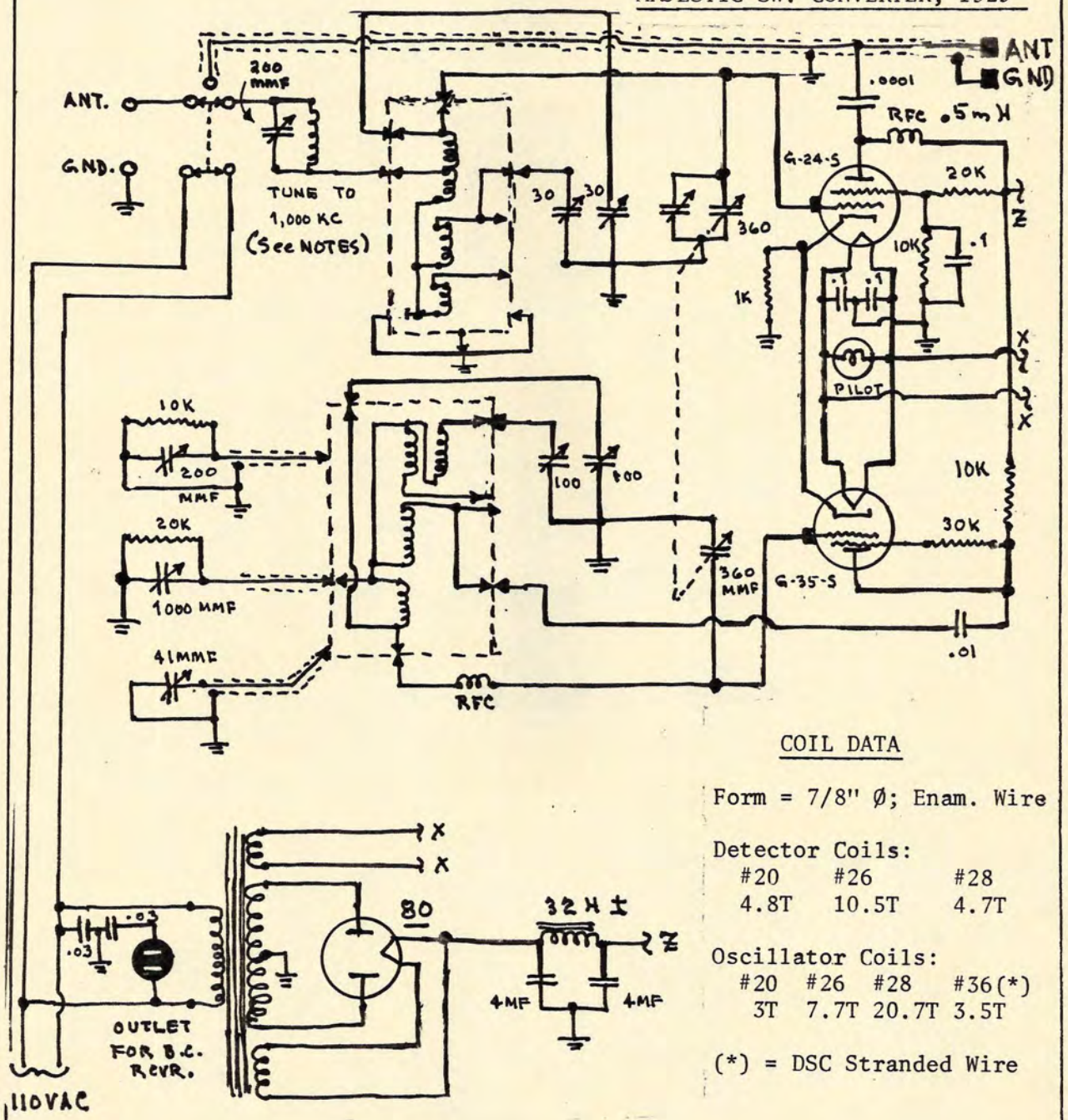






(RN 5-29)

MAJESTIC SW. CONVERTER, 1929



COIL DATA

Form = 7/8" Ø; Enam. Wire

Detector Coils:

#20	#26	#28
4.8T	10.5T	4.7T

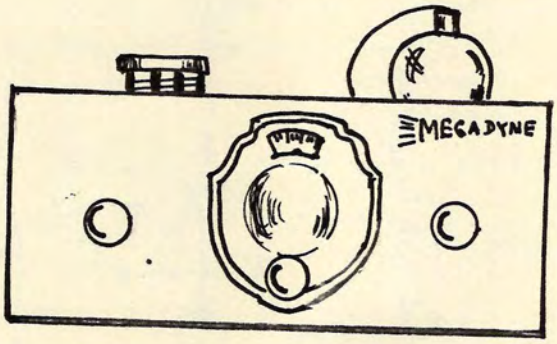
Oscillator Coils:

#20	#26	#28	#36(*)
3T	7.7T	20.7T	3.5T

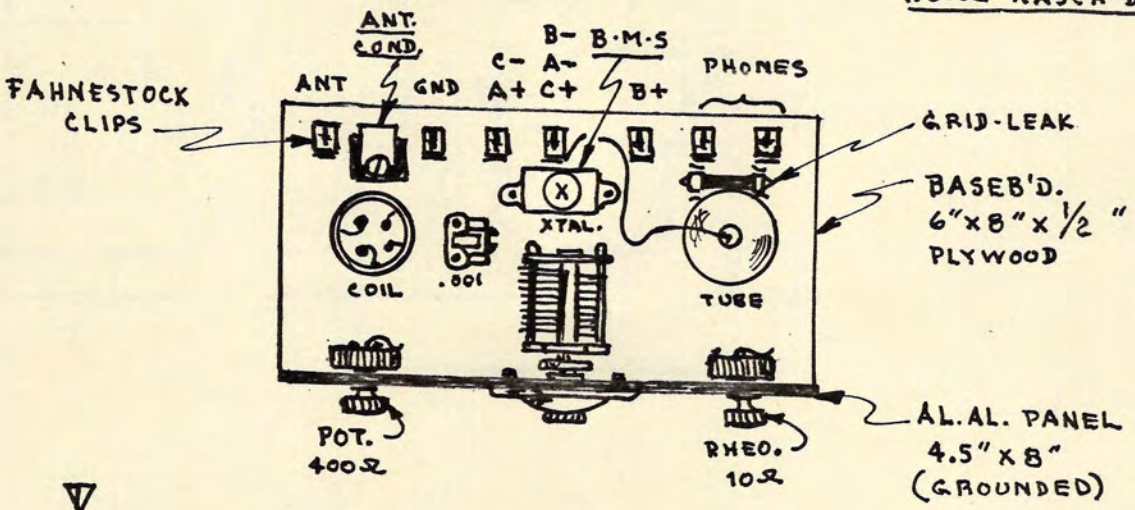
(*) = DSC Stranded Wire

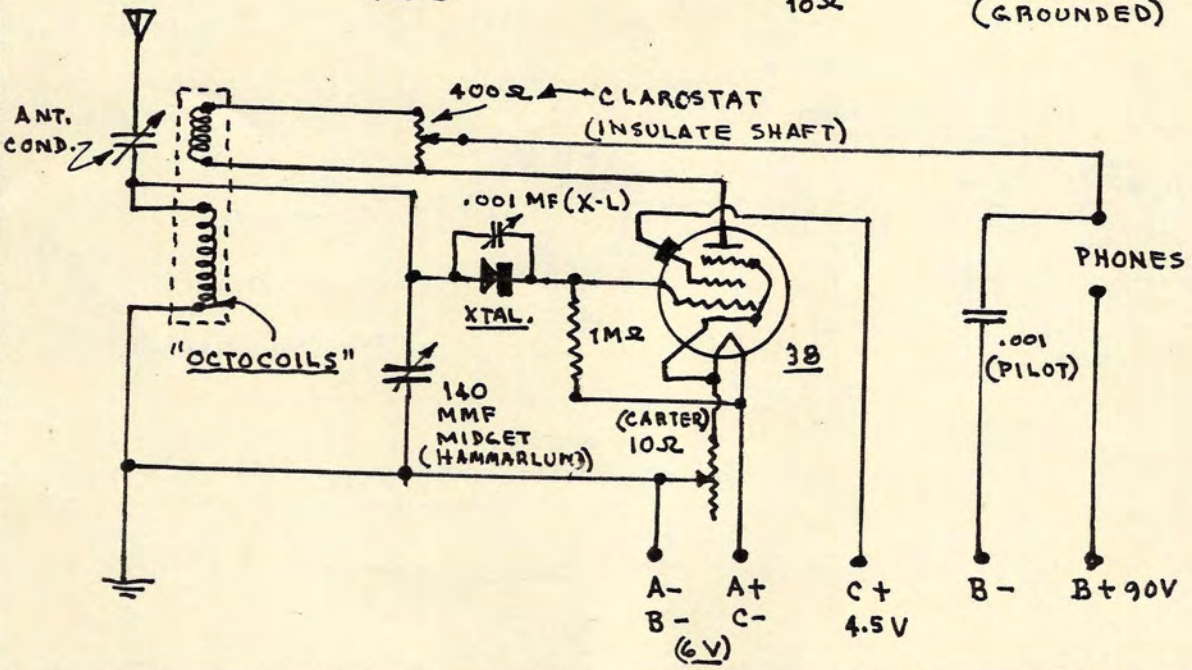
NOTE: As with their odd tube designations, Grigsby-Grunow designed odd coils for this unit: other coils are adaptable. If the 200 MMFD variable is replaced with a standard 350 MMFD, coil should have 81 Turns of #30 enamelled wire, close-wound.

GERNSBACK's "MEGADYNE" SW. RCVR.,1932

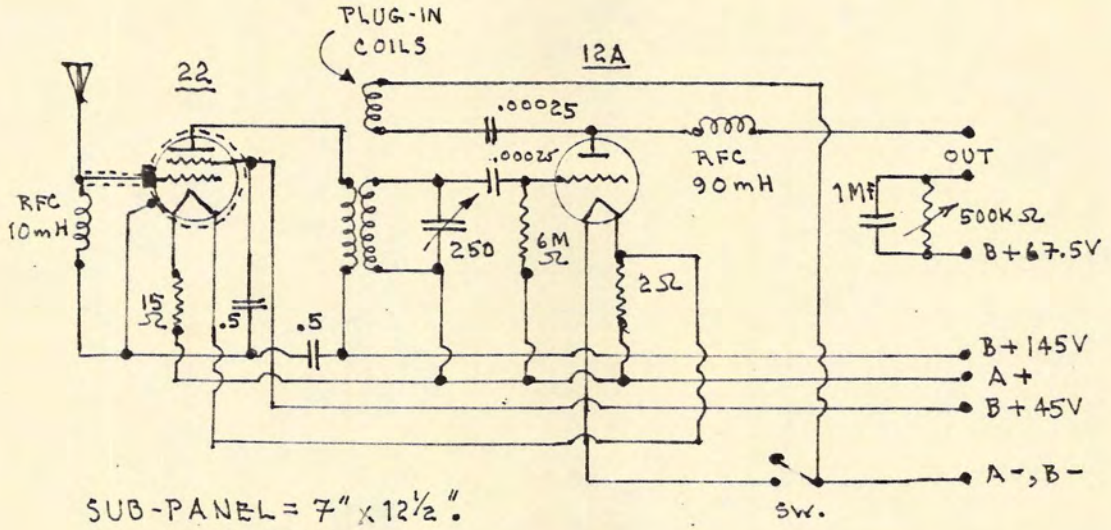


KURZ-KASCH DIAL



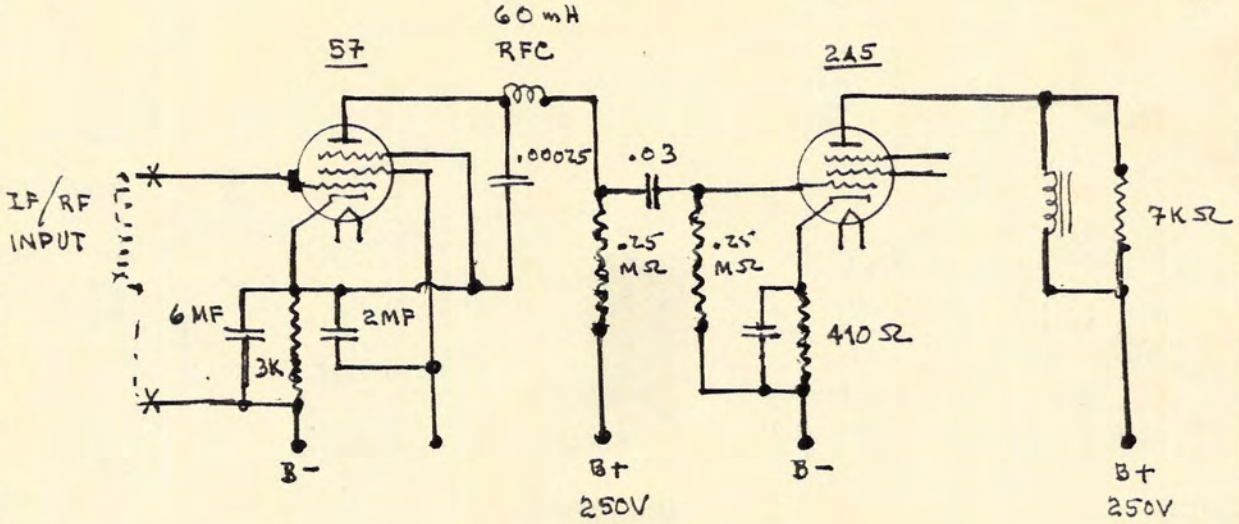


MILLEN SHORT-WAVE RECEIVER, 1928

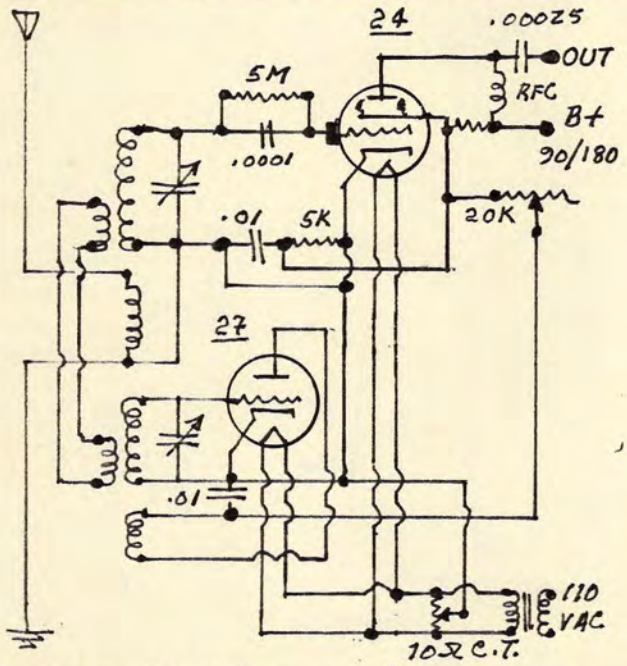


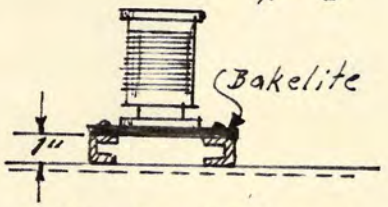
SUB-PANEL = 7" x 12½".
8 BINDING POSTS
(See also NAT'L. S.W. RCVR., 1928)

57 FEEDING THE 2A5 FOR PROPER LOAD



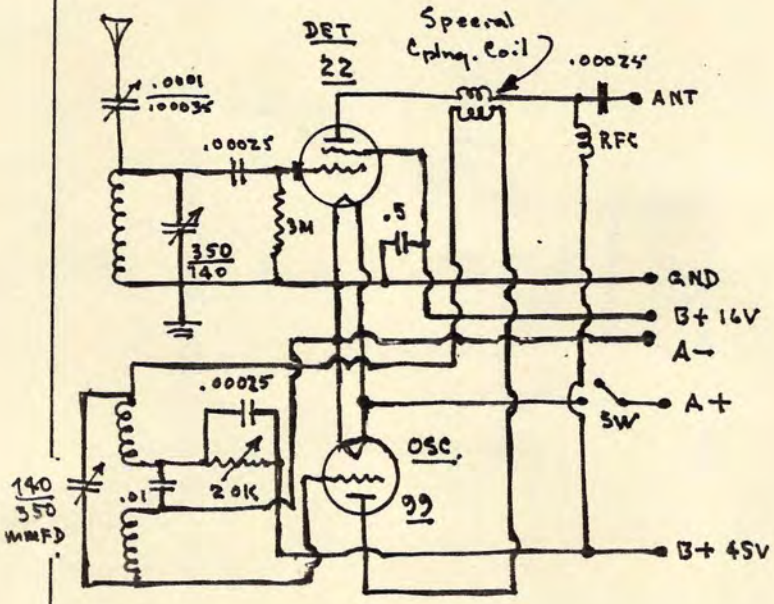
NATIONAL A.C. SW. ADAPTER, 1929

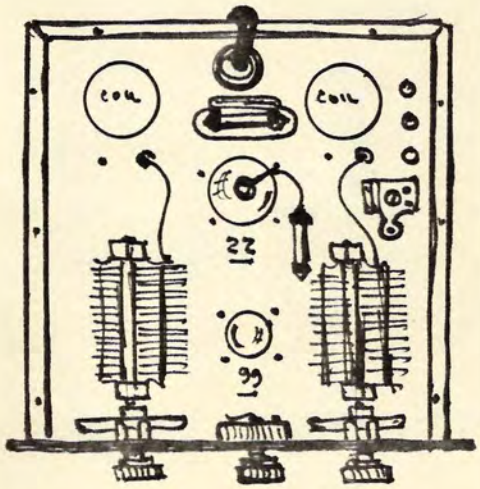




COIL BRKT. PROFILE

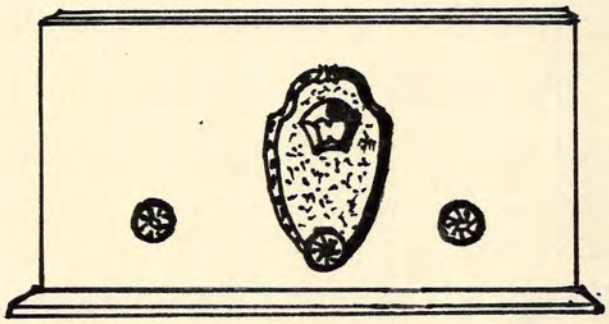
The National A.C. SW. adapter was derived from the "Supersonic" adapter, designed by Lt. Wood, which is shown below. The Wood adapter, refined by National, was produced and released under the National brand.



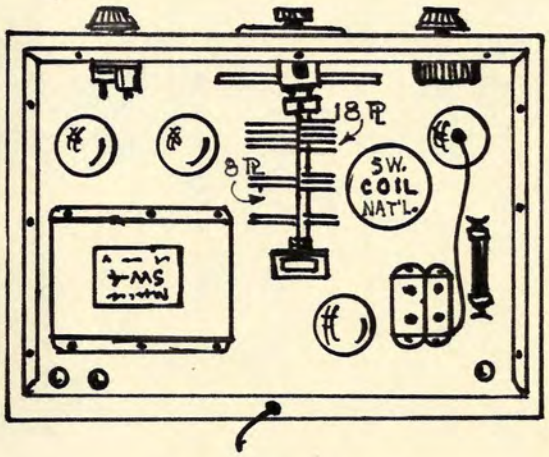


NATIONAL "THRILL BOX", 1929

(Designed By James Millen & Glen H. Browning.)

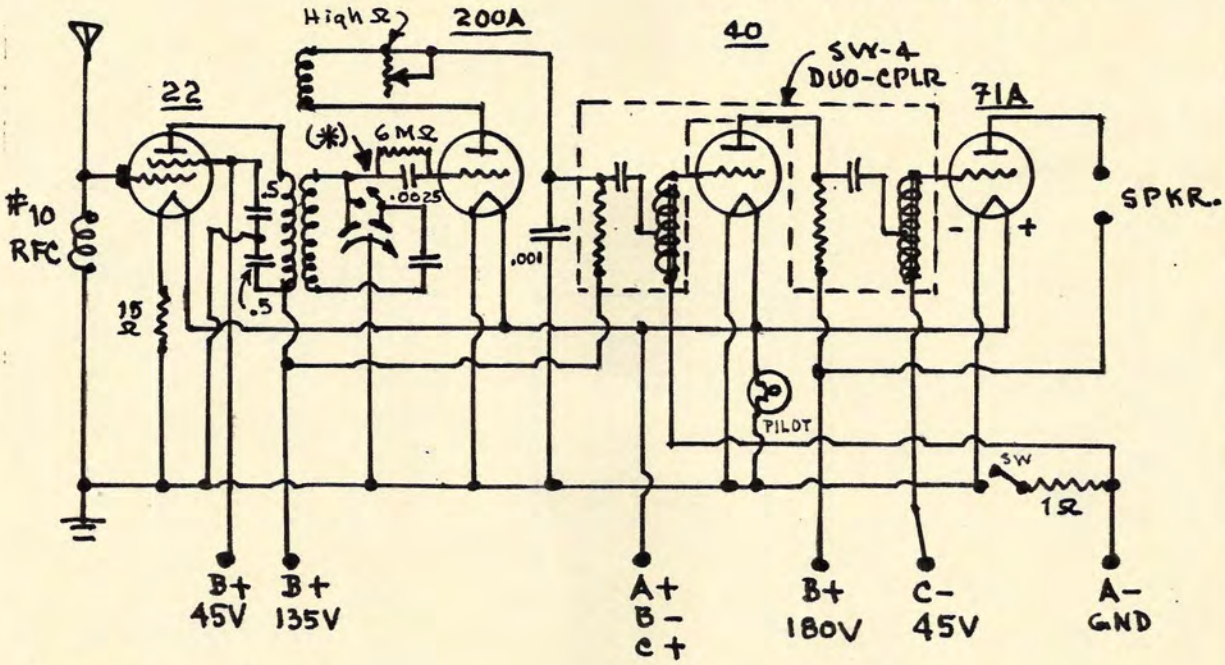


ELEVATION
(Nat'l. Steel Box)



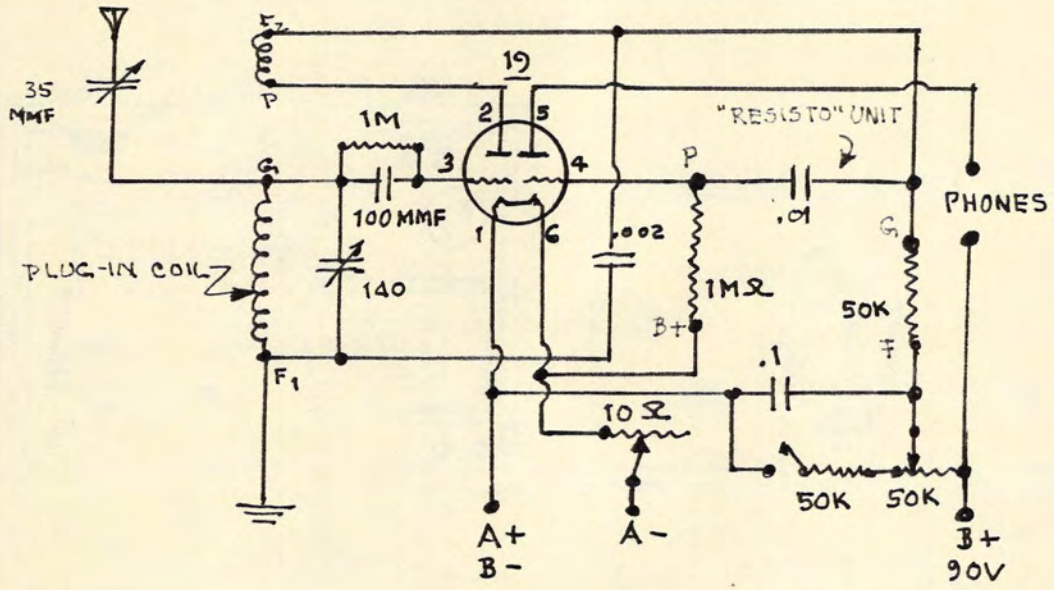
PLAN VIEW
(Cover Removed.)

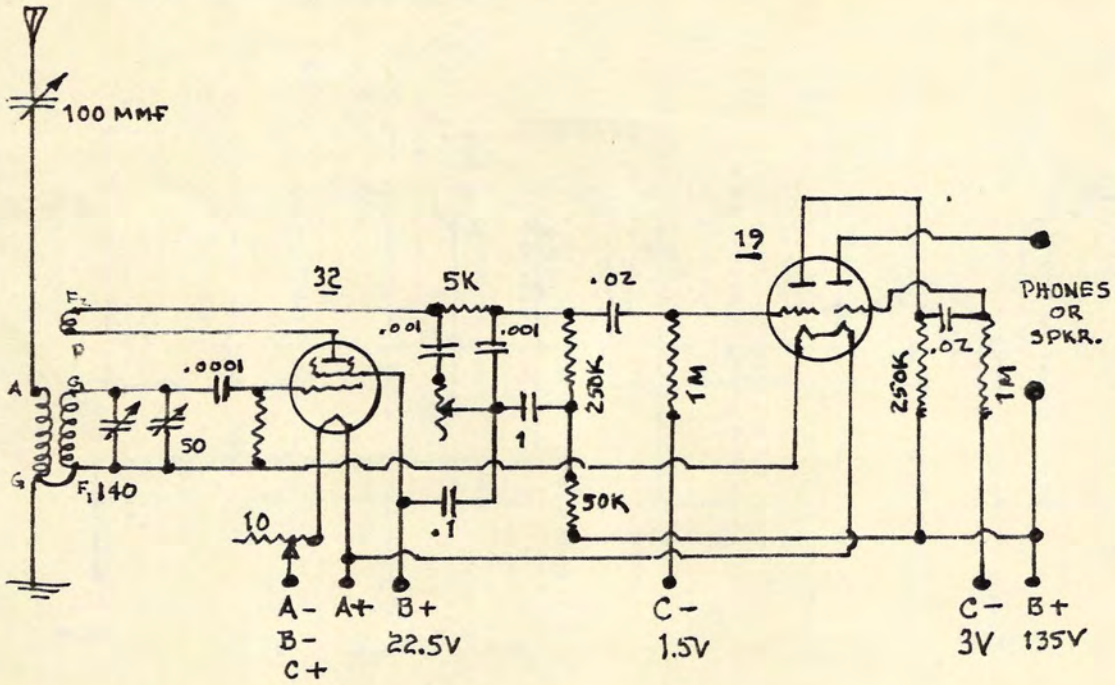
(✱) = SW. CUTS IN 18Ω VARIABLE.
SW. TUNING DONE w/ 8Ω.



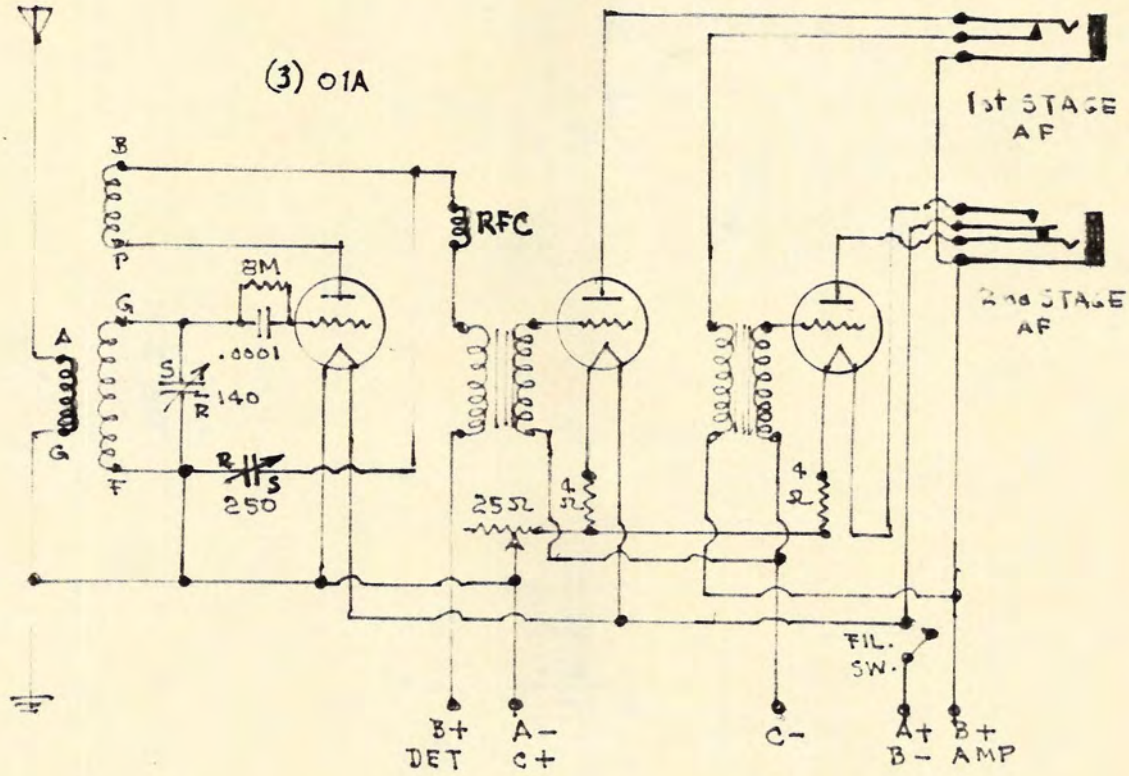
(RW 6·29·29)

ONE TUBE SW RECEIVER w/ 19 TUBE





AN "ORPHAN" SW. RCVR., 15-500 Meters;'26

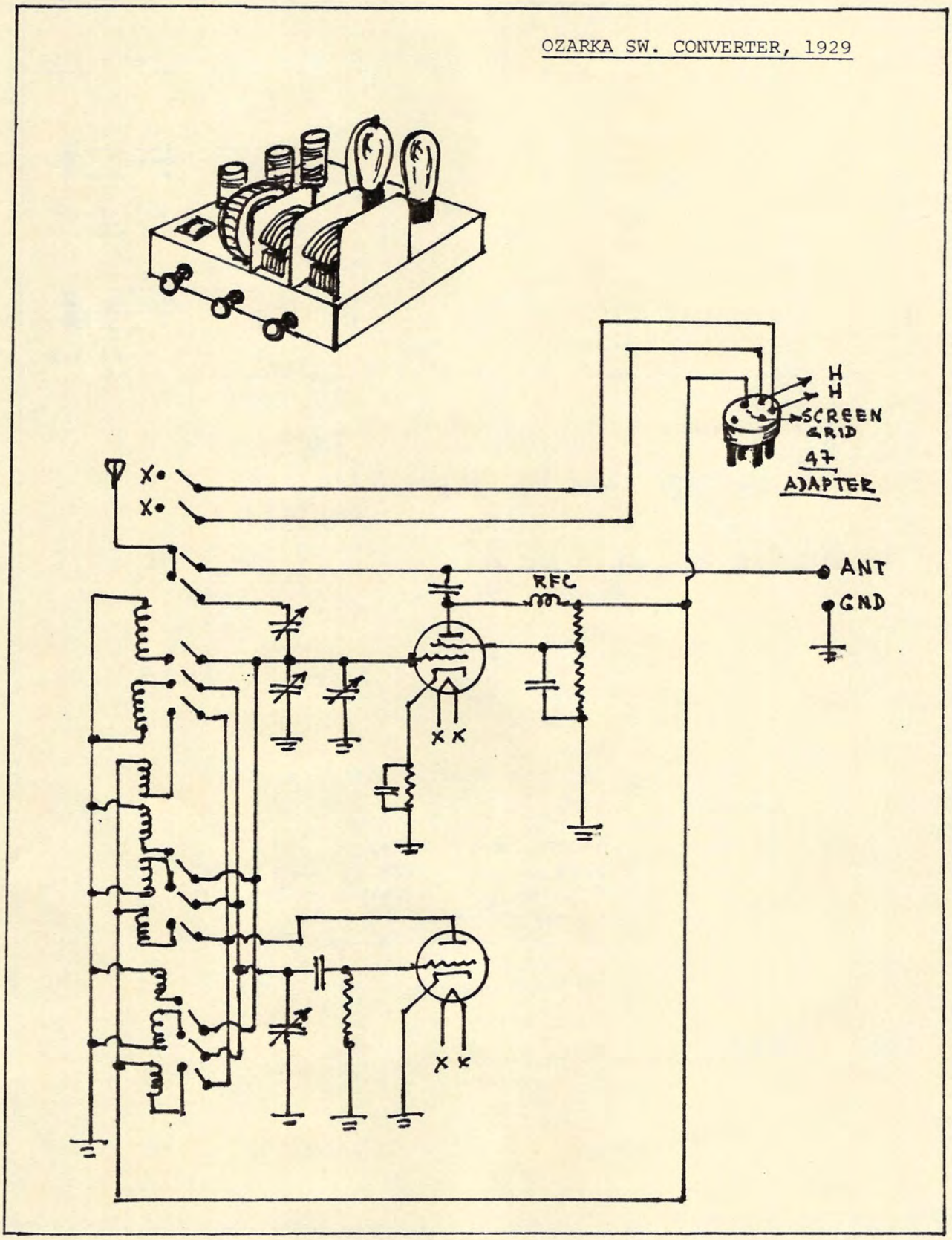


NOTES:

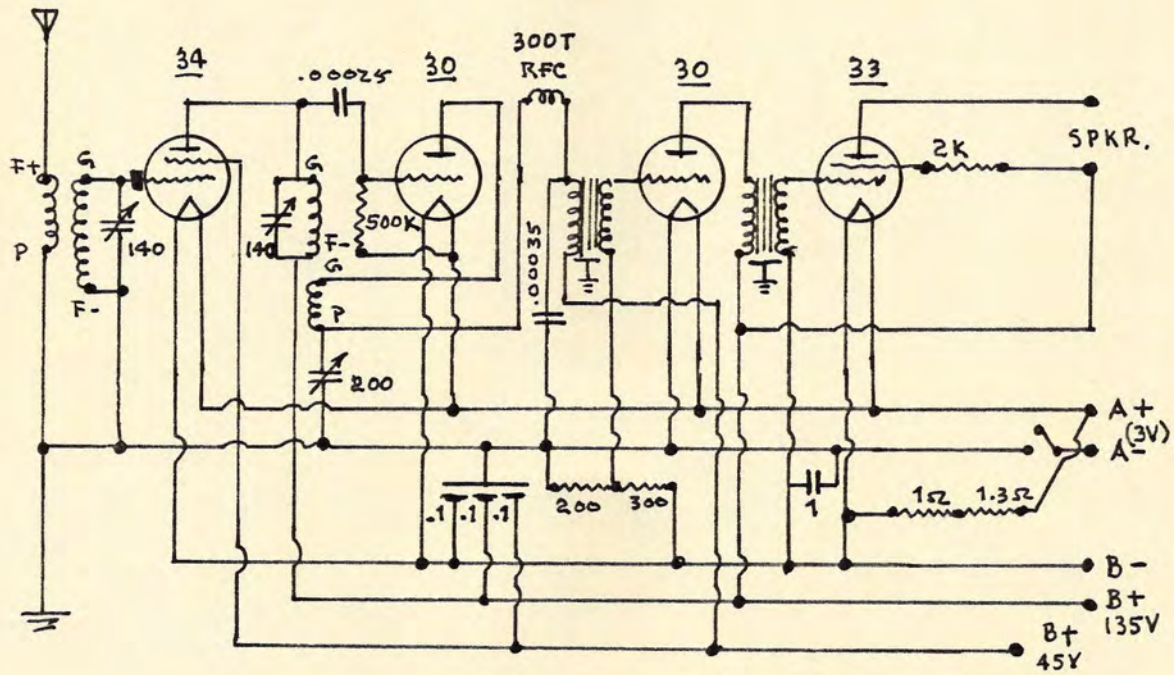
1. Grid return by trial-&-error; try A+ & A-.
2. Grid-leak may be variable.
3. Plug-in coils were 6-prong jobbies.
4. Regenerative DET; fixed tickler.
5. RFC may be made on a coil form 3½" long x 3/4" wide x ¼" wall thickness. #28 DCC wire, with 6" protruding from each end-hole; 200 turns.
6. If dead spots occur, loosen ANT coupling, or remove 5 to 10 turns from RFC.
7. Panel = 7" x 18"; baseboard = 7" x 17" x ½"

(CB 9·26/3·27)

OZARKA SW. CONVERTER, 1929

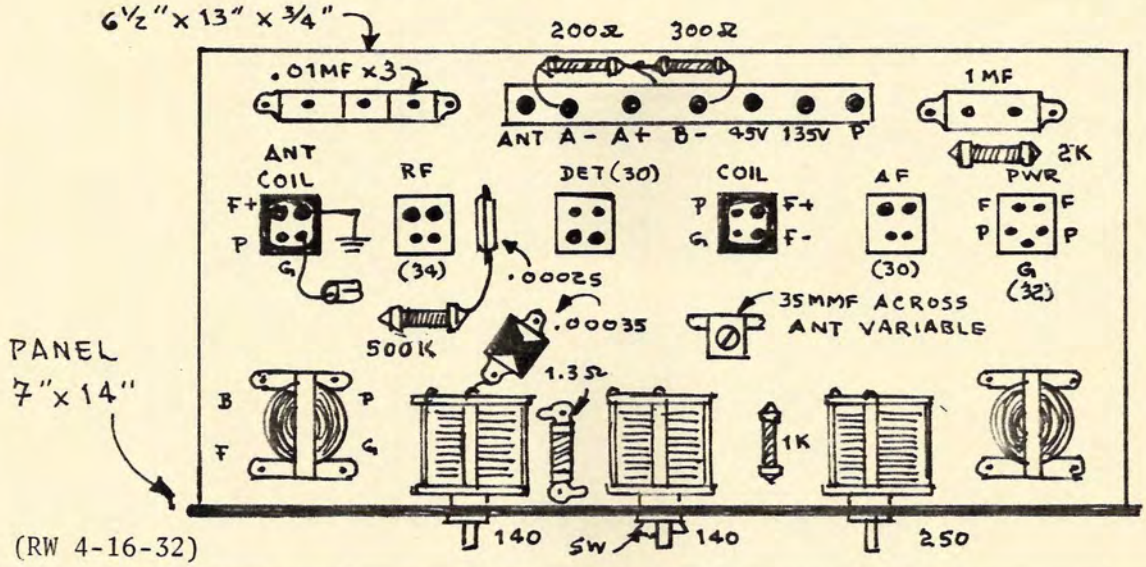


O'ROURKE 4-TUBE BATTERY SW SET, 1932



ANT & INTERSTAGE coils required.
Grid Coil = 10T #18 Enamelled Wire - 24-40 Meters.
Plate Coil = 10T #32 " " - " " .

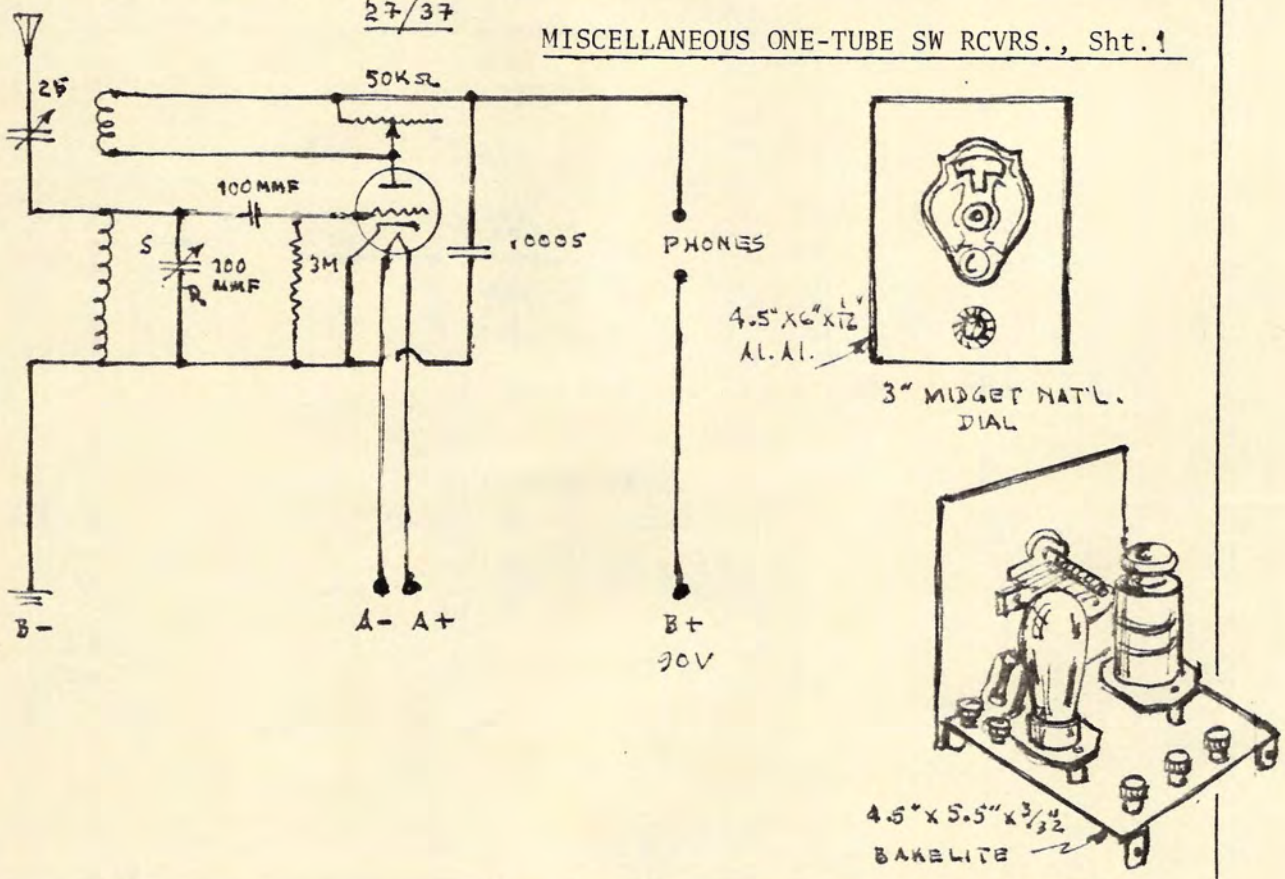
Grid Coil = 4T #18 Enamelled Wire - 15-24 Meters
Plate Coil = 7T #28 " " - " " .

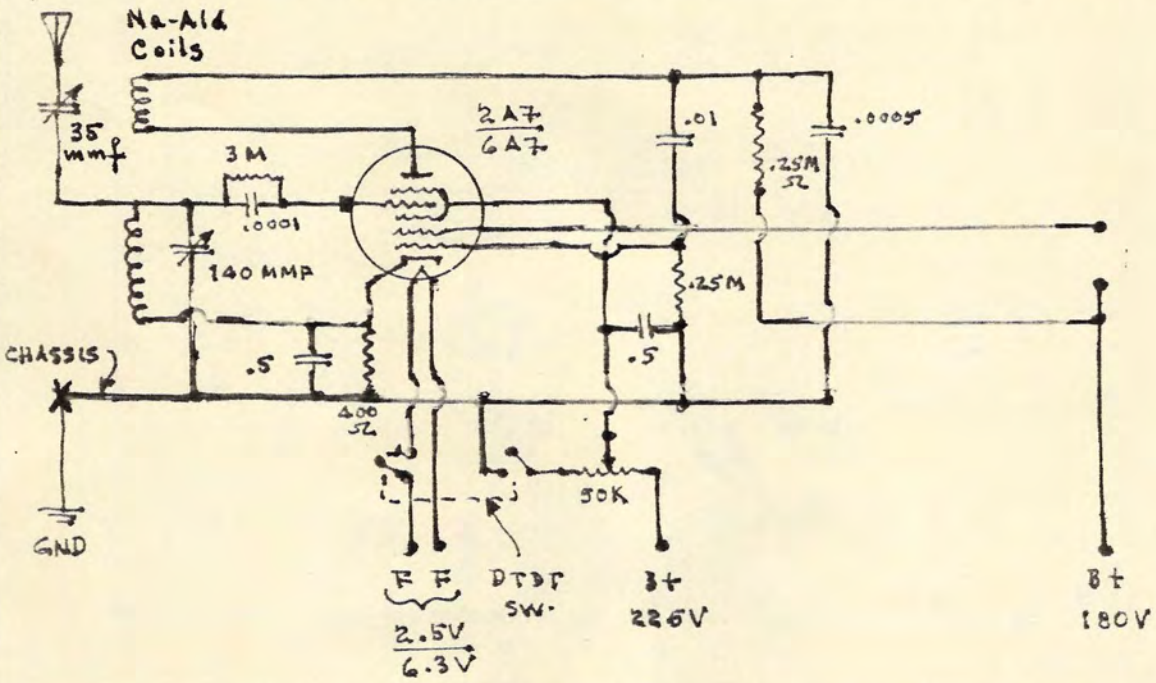


(RW 4-16-32)

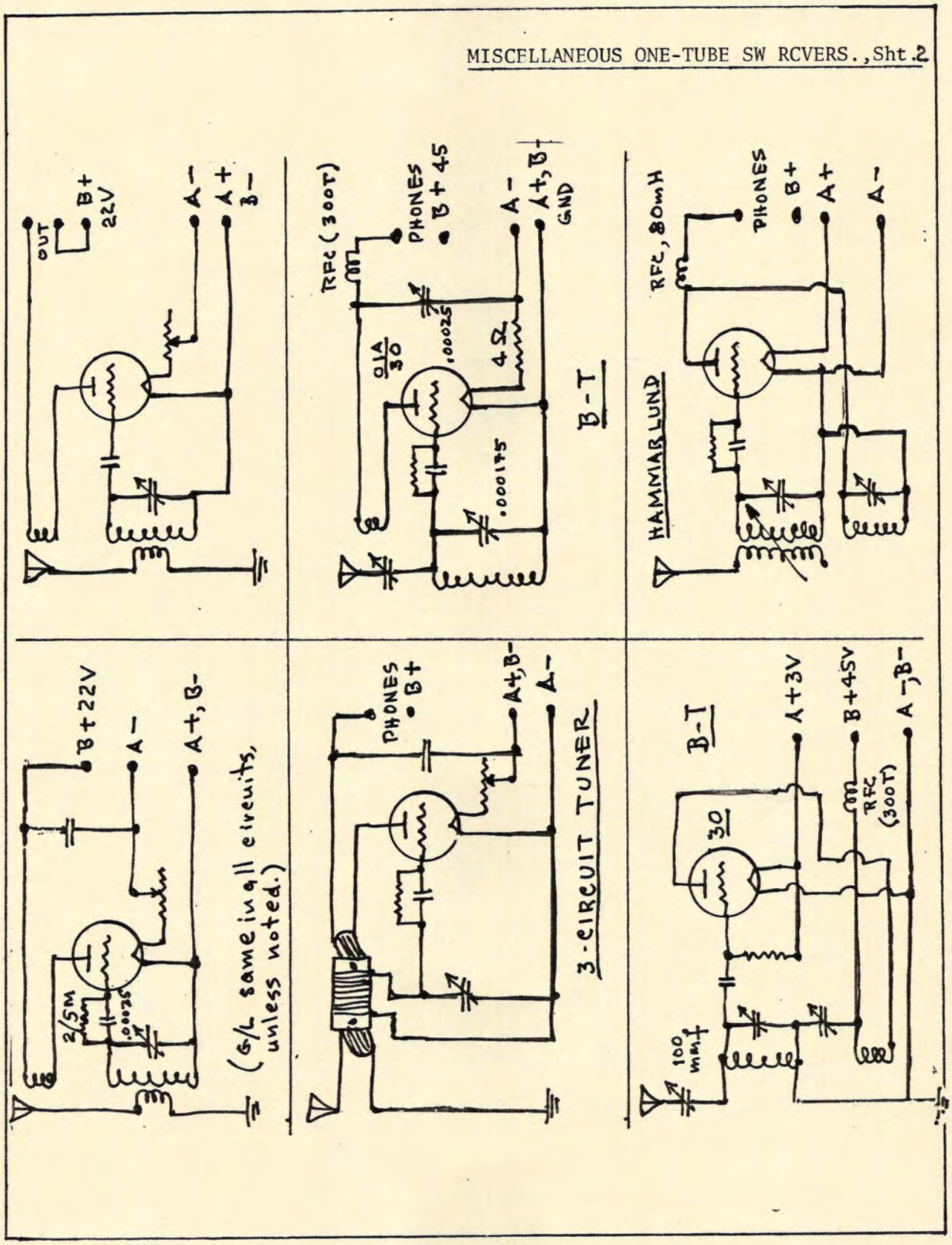
27/37

MISCELLANEOUS ONE-TUBE SW RCVRS., Sht. 1

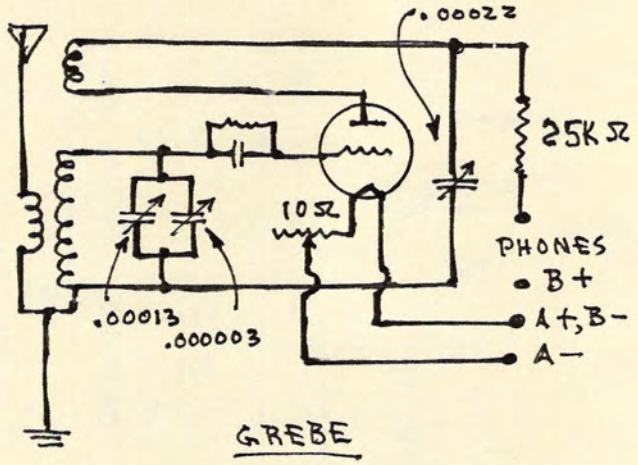


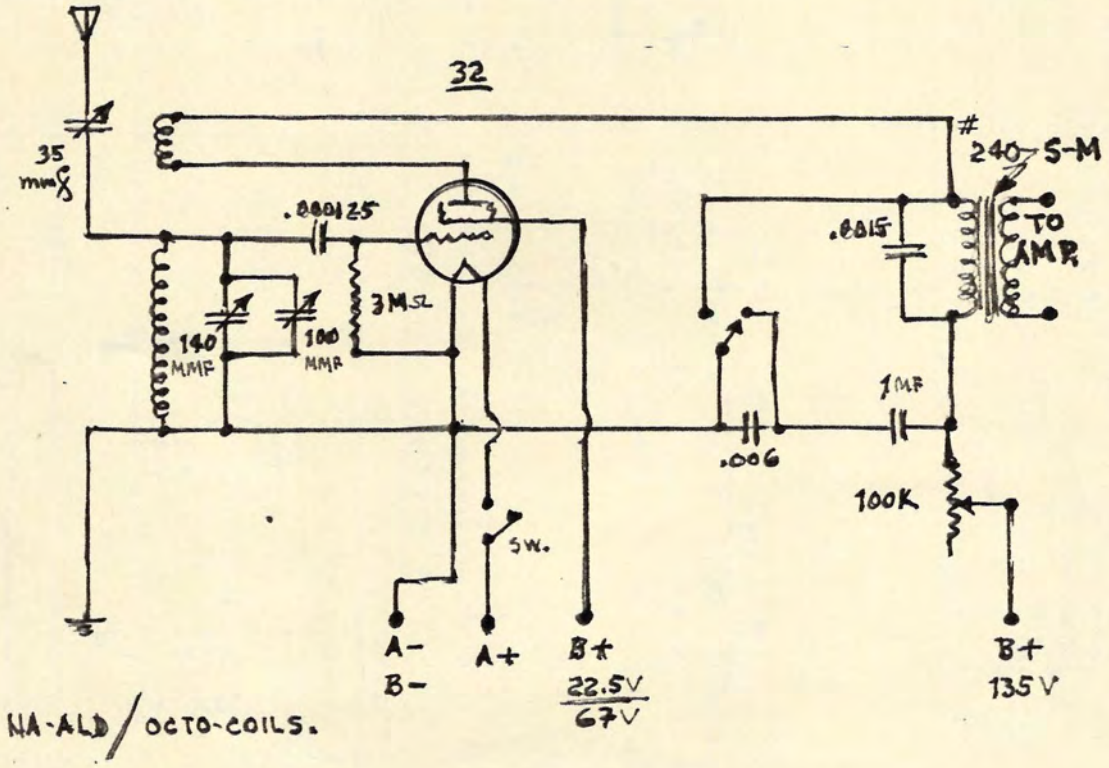


MISCELLANEOUS ONE-TUBE SW RCVERS., Sht. 2

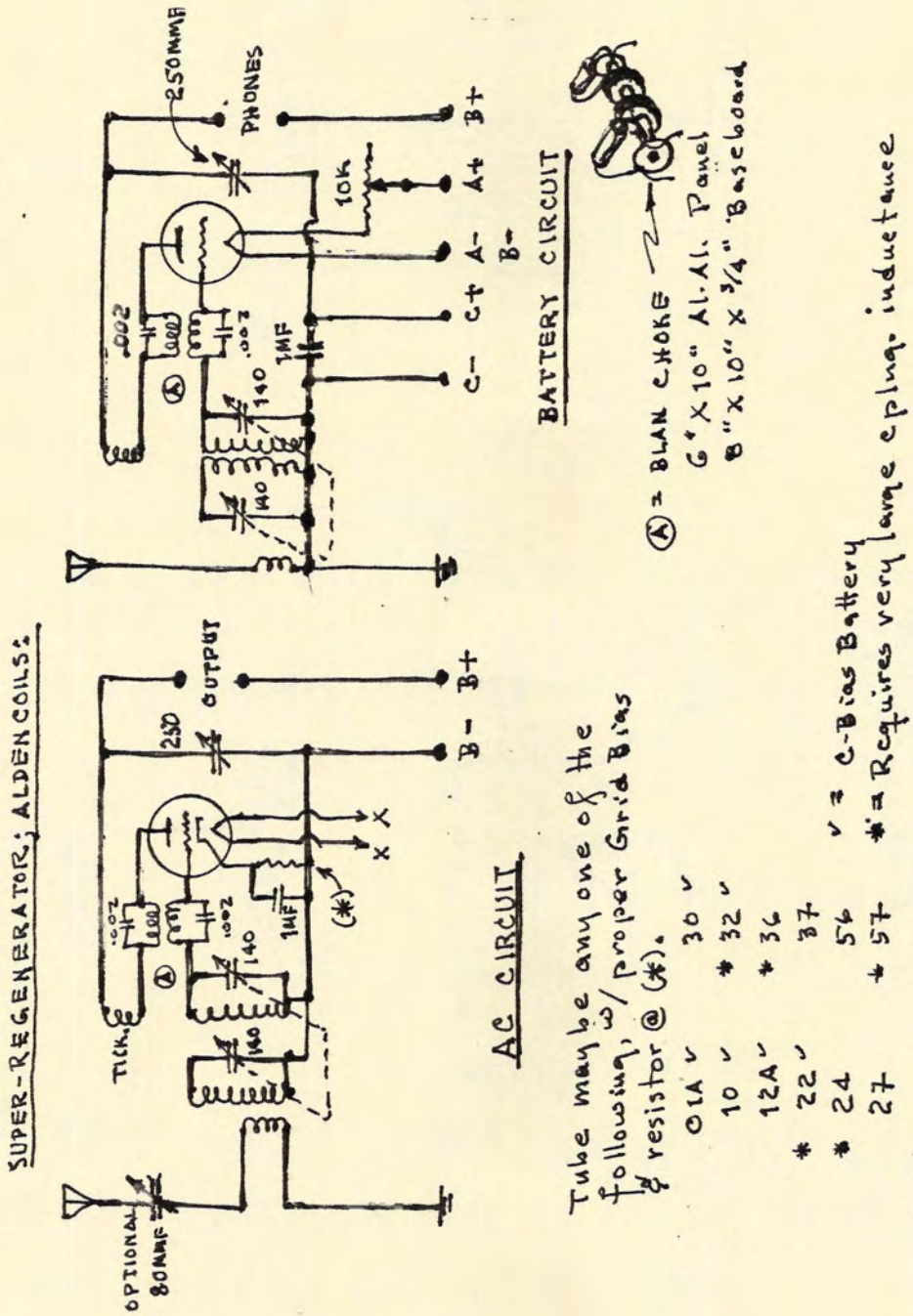


MISCELLANEOUS ONE-TUBE SW RCVR., Sht.4

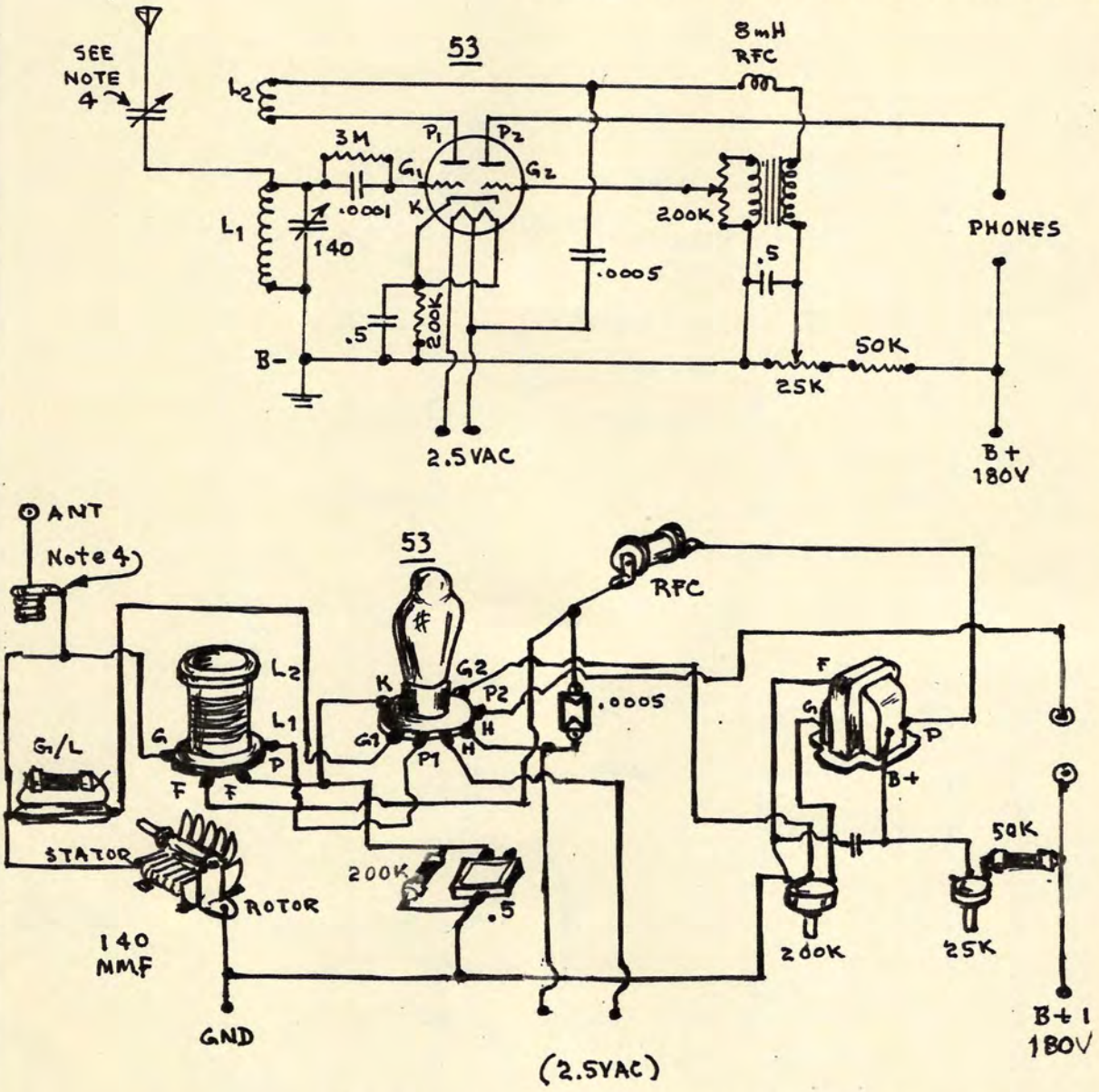


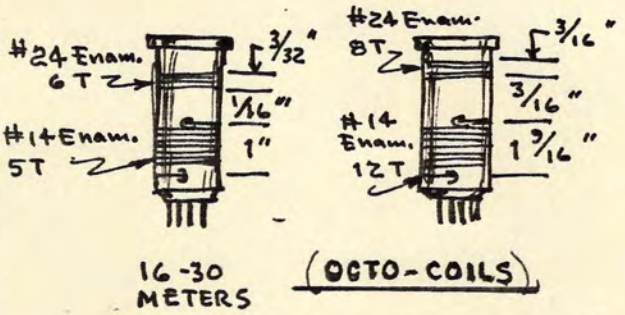


MISCELLANEOUS ONE-TUBE SW RCVRS., Sht.3



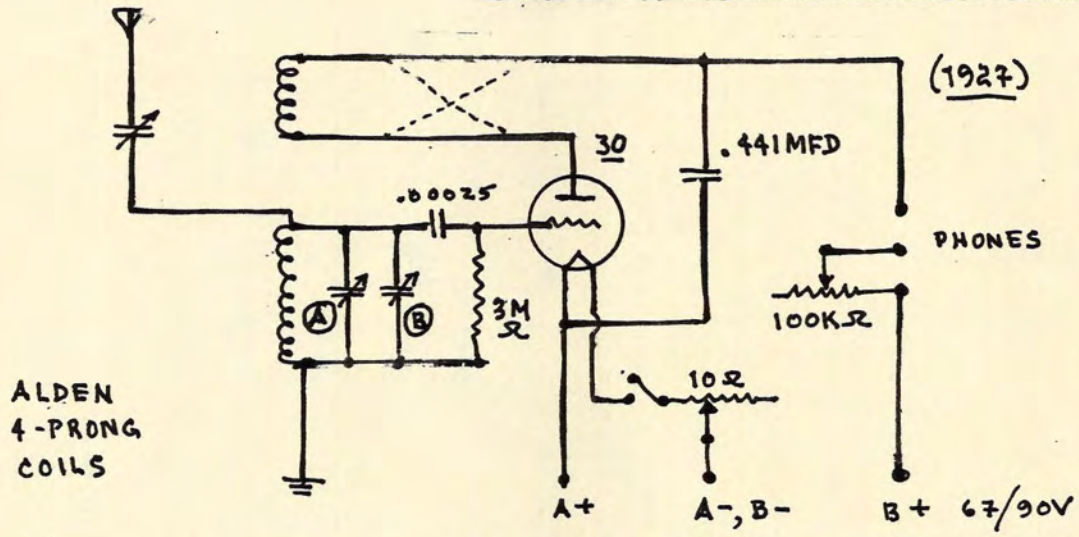
MISCELLANEOUS ONE-TUBE SW RCVRS., Sht. 5





NOTES:
1. Cabinet = 7" x 9" x 7"
2. Baseb'd. = 7" x 9" x .75"
3. 7-Pring sckt. for 53 tube
4. ANT has 5T #12 bare copper wire, as shown.
5. Coil forms = 3.064" x 1.6
6. SEC of coil connected to "G" & "F"; TICKLER is connected between "P" & "F1" prongs.

MISCELLANEOUS ONE-TUBE SW RCVRS., Sht. 7

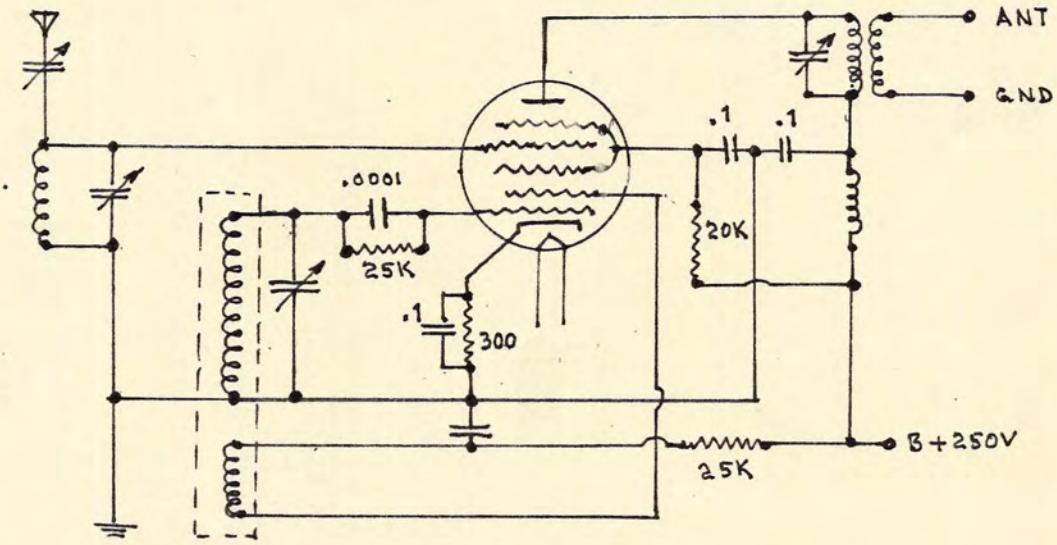


(A) = PILOT 23-plate variable. (B) = PILOT 7-plate variable.

If no regeneration occurs, reverse leads at dotted lines.

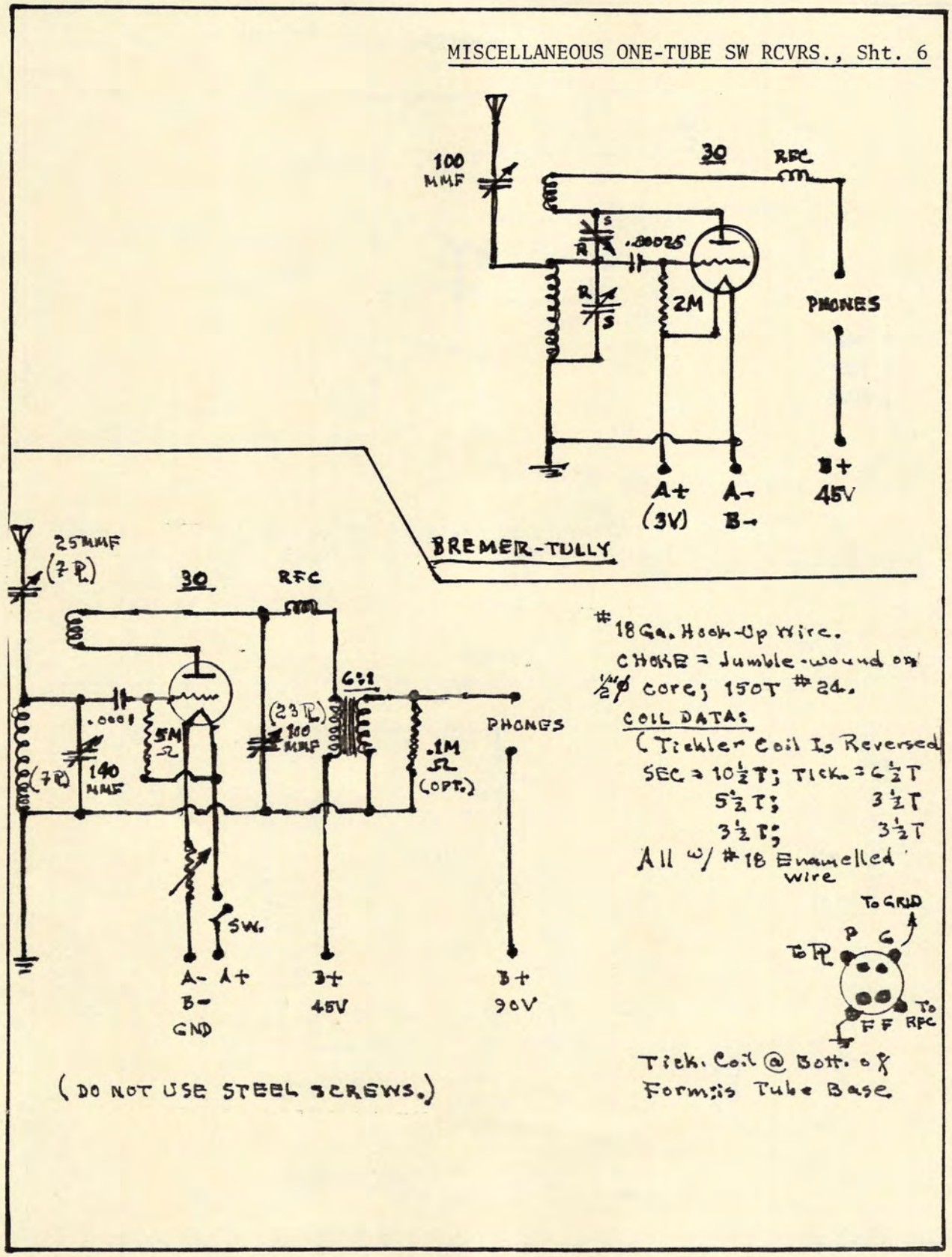
COIL DATA:			
10-20 Meters	: PRI 4T #31 DSC.	SEC 4.75T, 6 TPI.
20-40 "	: PRI 6T " .	SEC 10.75T, 12 TPI.
40-80 "	: PRI 7T " .	SEC 22.75T, 16 TPI.

ON-OFF switch is on the 100K pot.

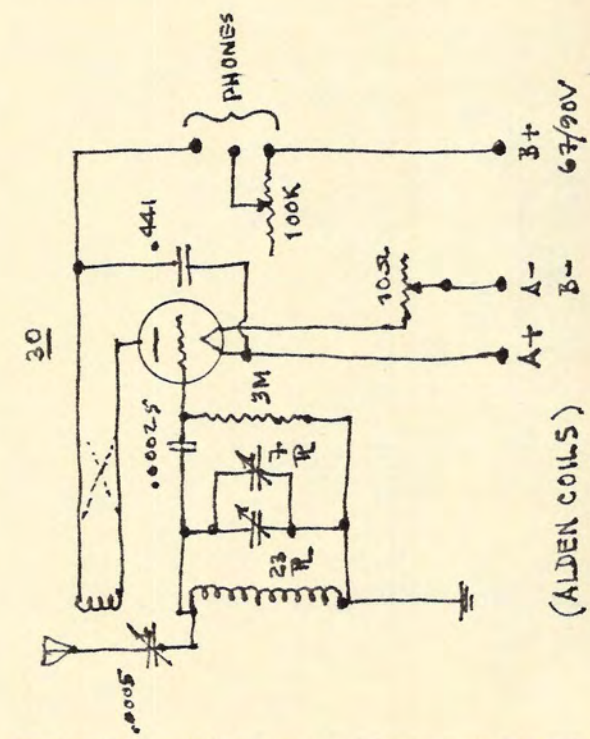


PENTAGRID CONVERTER

MISCELLANEOUS ONE-TUBE SW RCVRS., Sht. 6



ONE-TUBE SHORT-WAVE RECEIVERS, Sht. 8



(ALDEN COILS)

If no Regeneration, reverse leads @ Dotted Lines.

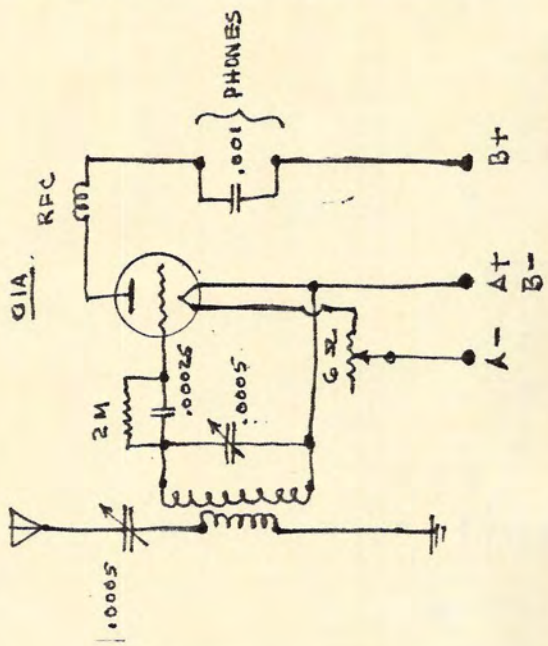
ON-OFF SW. on 100K POT.

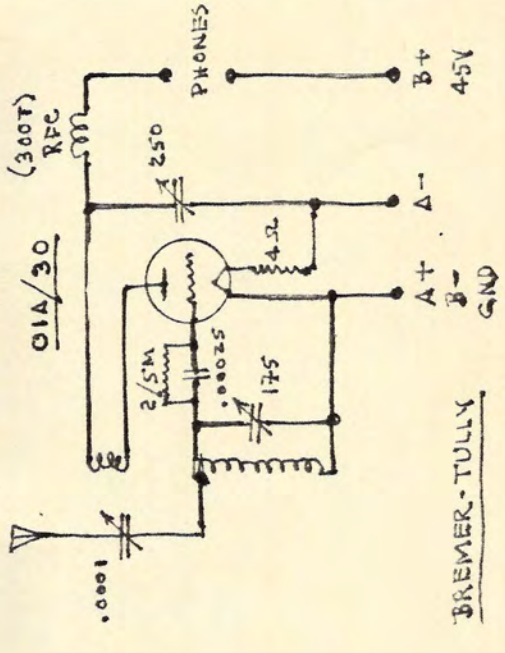
COIL DATA

40-80 Meters = 22.75T, #22 DSC
7T, #31 DSC
(16 turns per inch.)

20-40 Meters = 10.75T, #22 DSC
6T, #31 DSC
(12 Turns per inch.)

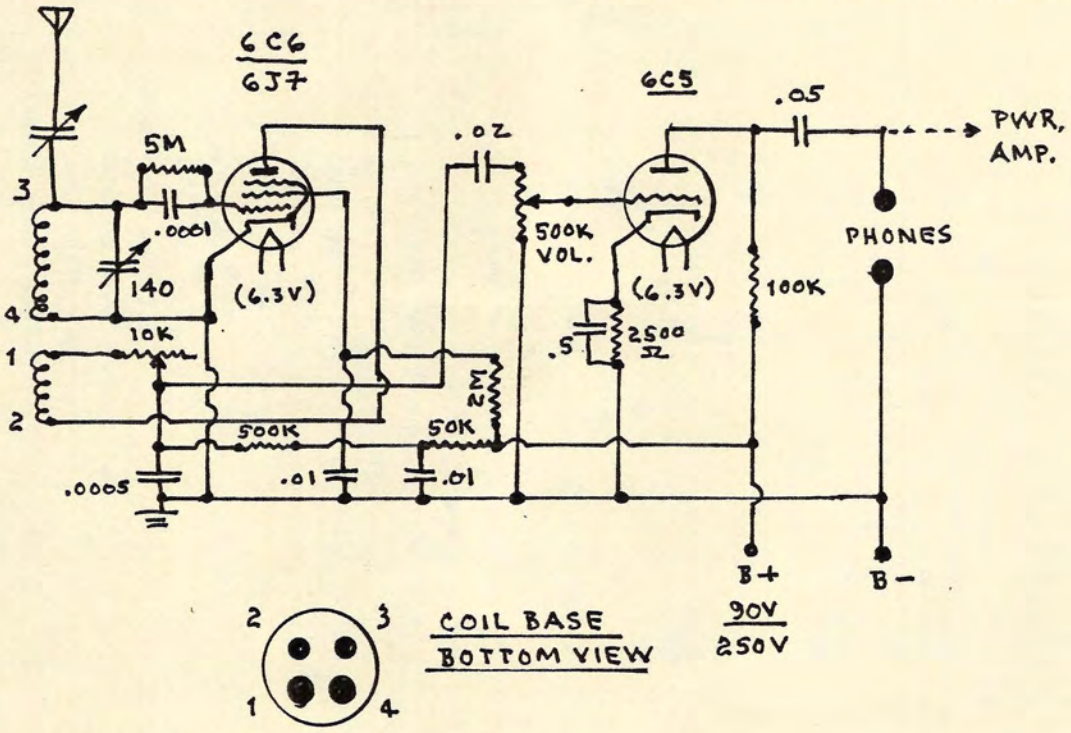
10-20 Meters = 4.75T, #22 DSC
4T, #31 DSC
(6 Turns per Inch.)



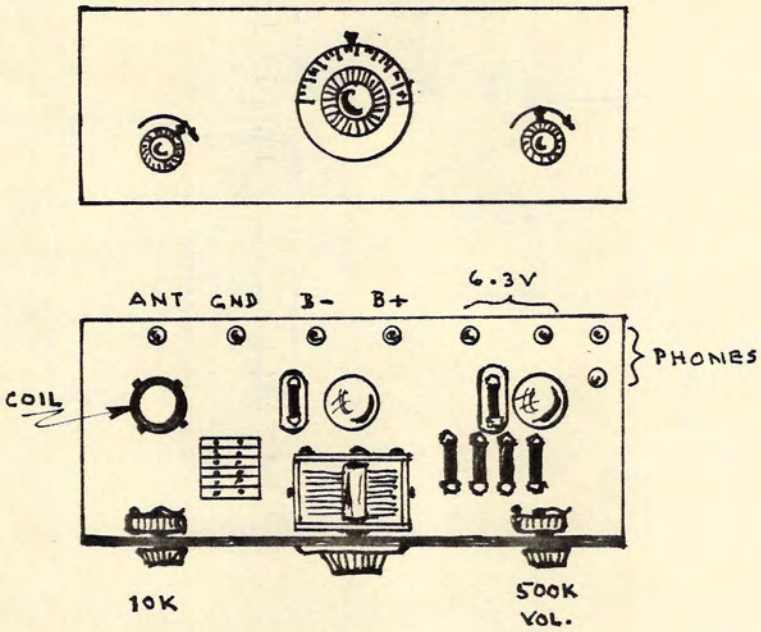


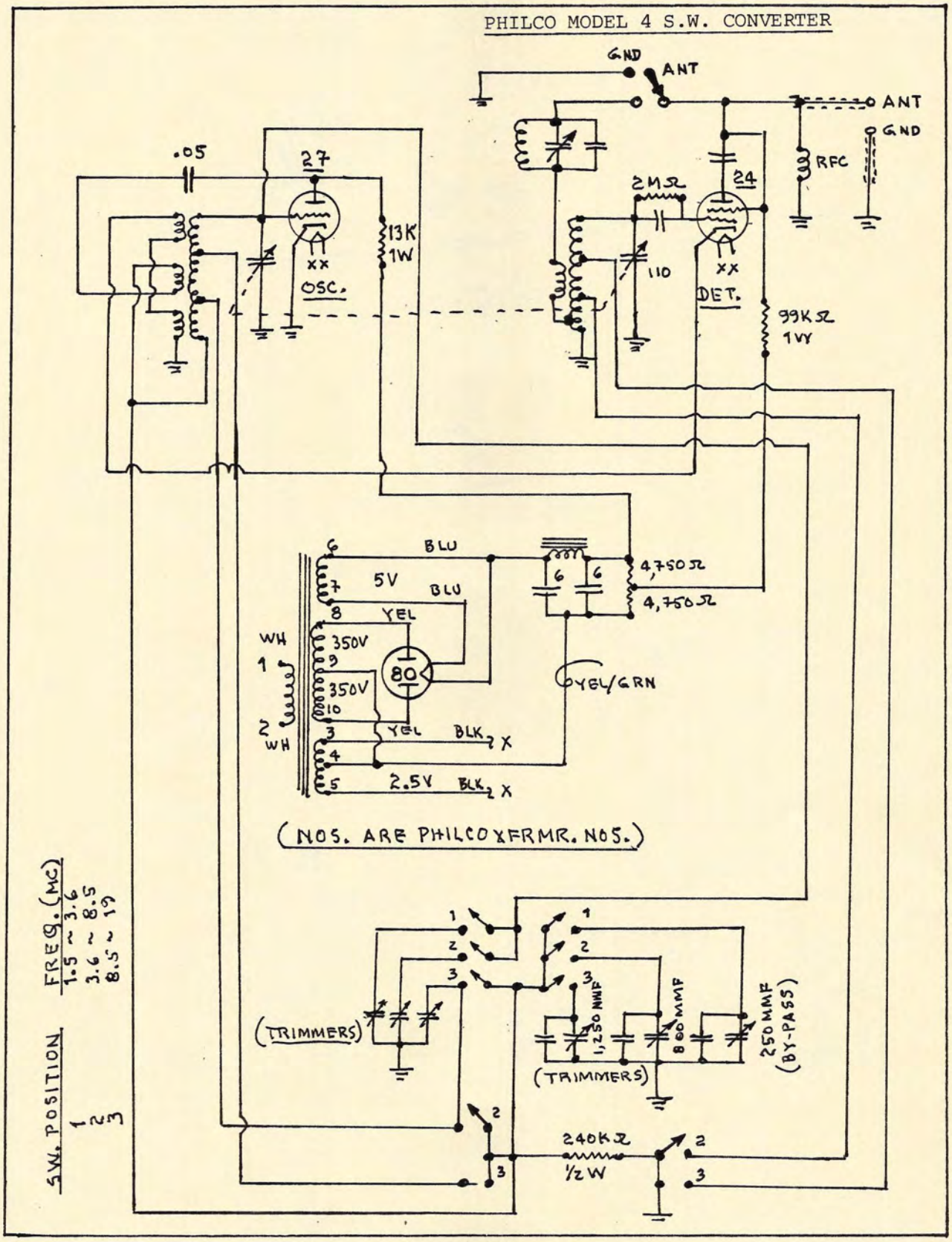
BREMER-TULLY

PHILMORE SW. CIRCUIT



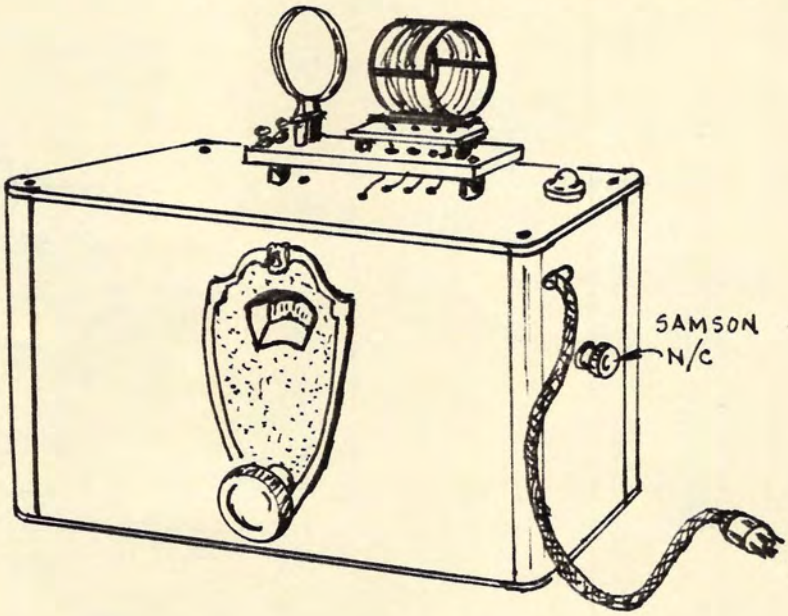
Coils will work with any good regenerative receiver.

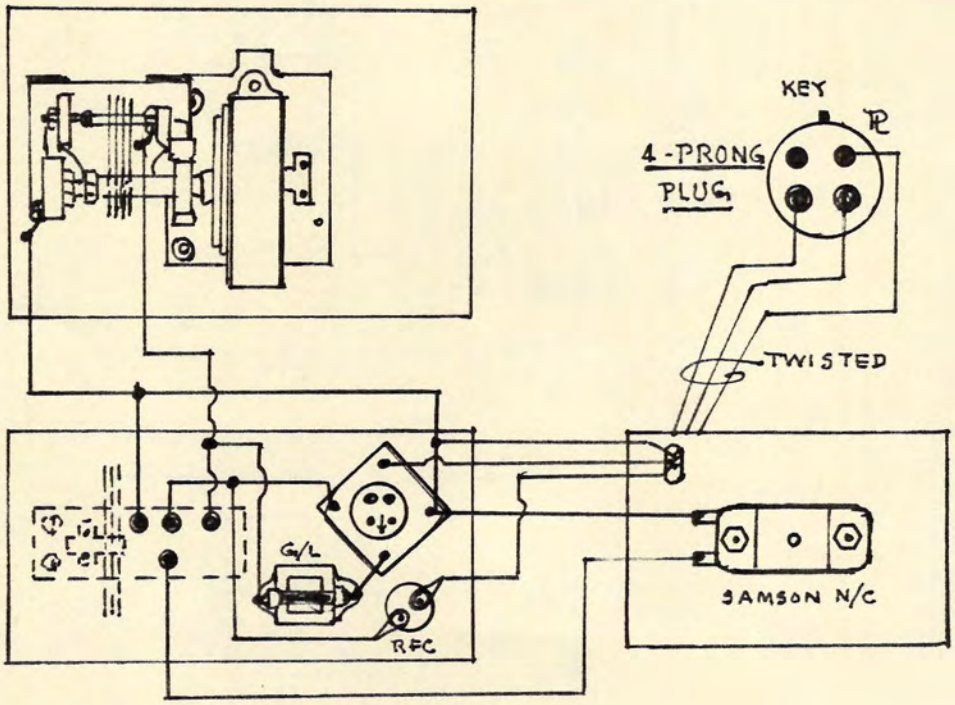



PHILCO MODEL 4 S.W. CONVERTER
GND
ANT
ANT
GND
RFC
.05
27
24
2MΩ
13K
1W
XX
OSC.
110
XX
DET.
99KΩ
1W
BLU
5V
BLU
YEL
350V
80
350V
YEL
BLK
X
2.5V
BLK
X
WH
WH
4,750Ω
4,750Ω
YEL/GRN
(NOS. ARE PHILCO XFRMR. NOS.)
FREQ. (MC)
1.5 ~ 3.6
3.6 ~ 8.5
8.5 ~ 19
SW. POSITION
1 2 3
(TRIMMERS)
1,250 MMF
860 MMF
250 MMF
(BY-PASS)
(TRIMMERS)
240KΩ
½W

(Sht. 1)

PR SHORT-WAVE CONVERTER, 1928 - $30



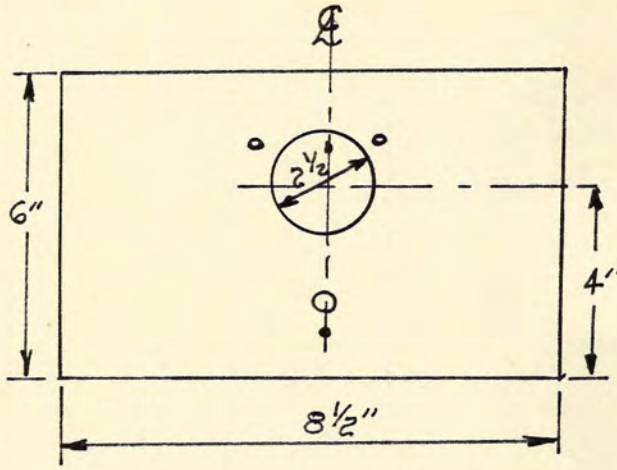


BOTTOM of TOP PANEL

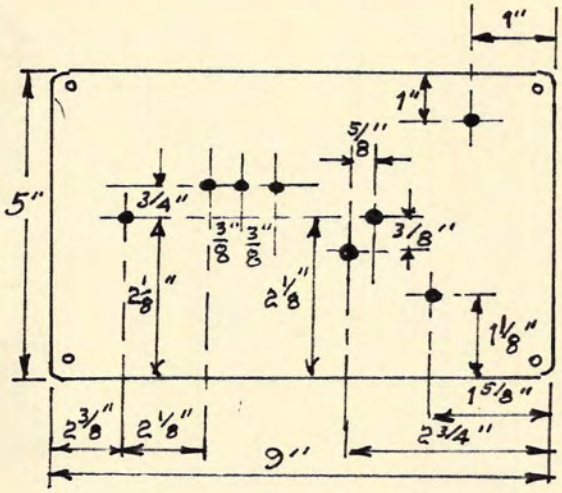
(PR 4-28)

(Sht. 2)

PR SHORT-WAVE CONVERTER, 1928



Hole pattern from NAT'L. Dial template enclosed w/ Dial.



TOP PANEL

(Bottom panel same but w/out hole pattern.)

PARTS LIST:

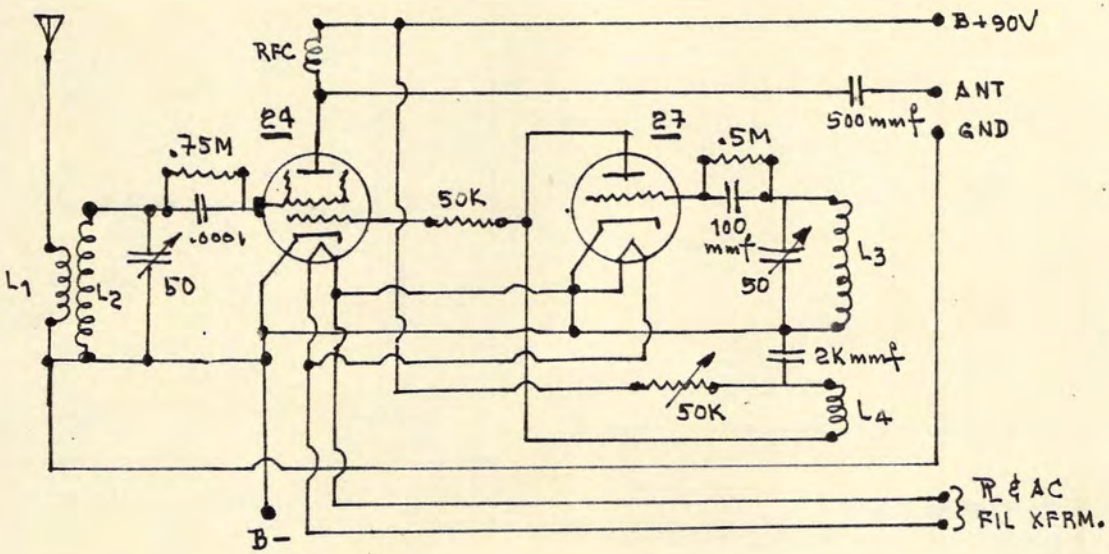
AERO Coil Set LWT-125.
AERO RFC No. 60.
NAT'L. "Equitune" Variable, 150 mmf.
NAT'L. Type F Dial, w/Drum.
SAMSON Neutralizing Condenser.
ALCOA Box Shield, 5"x9"x6". (Std.)
8 MΩ Grid-Leak.
AEROVOX .0001 mf #1475 Condenser.
BENJAMIN Socket #9040.
AEROVOX Cable & Plug.

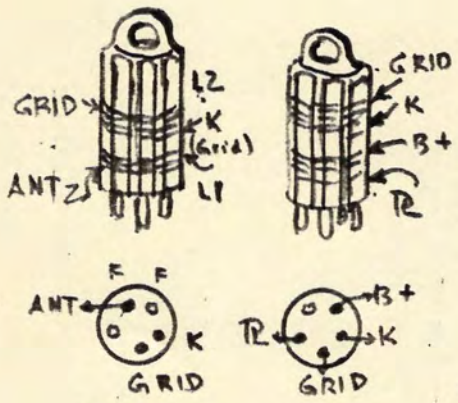
Neutralizing cond. insulated from box!

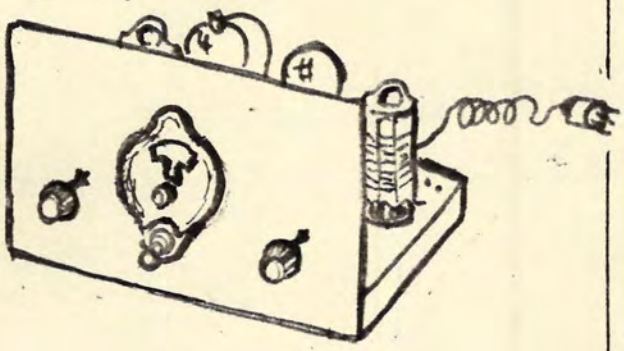
Plug goes into DET socket in set; DET tube goes into converter tube socket. Power derives from set.

(PR 4·28)

Q.S.T. SW. CONVERTER, 1930

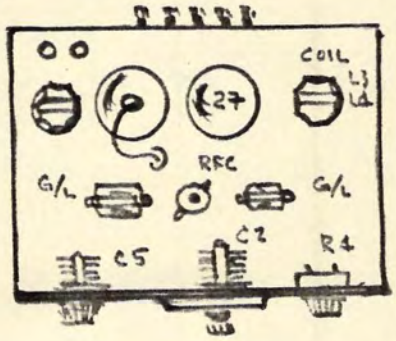






Pilot Coil Forms.

Nat'l. Dial.

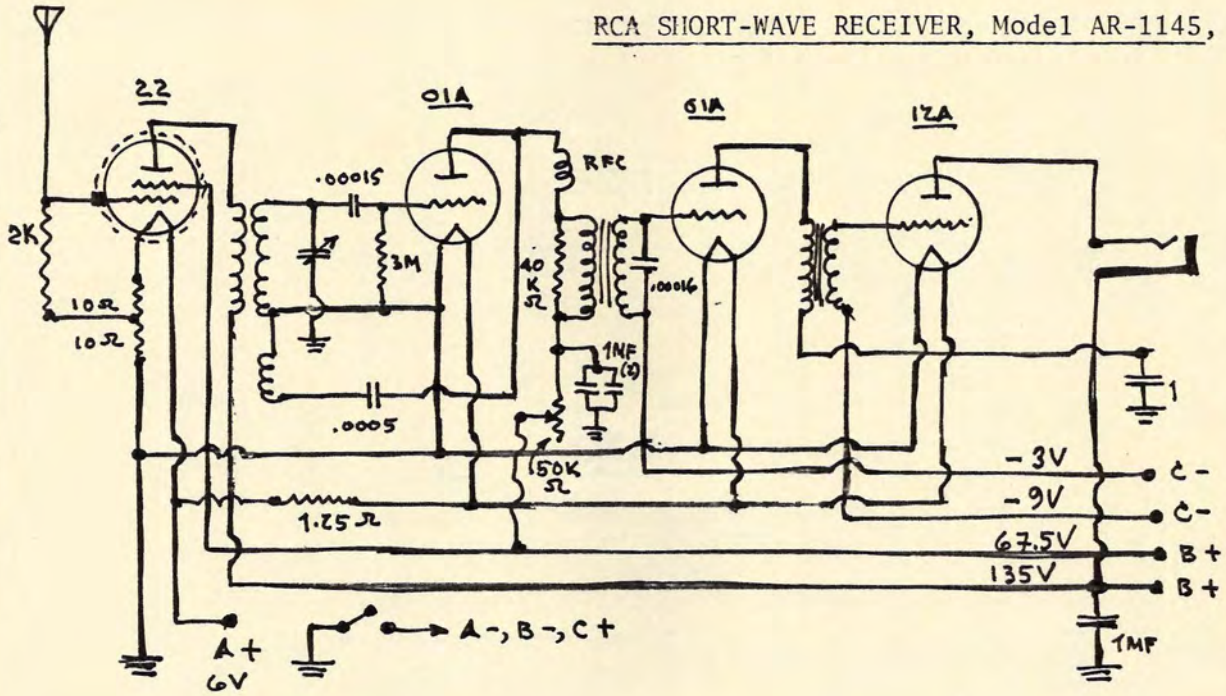


COIL DATA: (#22 DSC, 1½" Ø Forms)

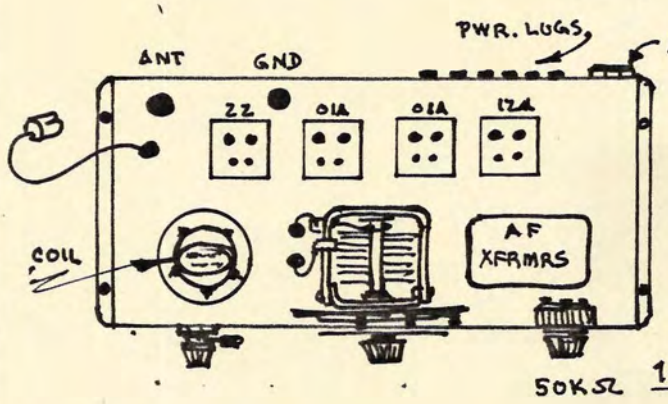
	L1	L2	L3	L4
5KC-7KC	12T	16T	20T	9T
8KC-13KC	7	8	9	4
13KC-19KC	5	5	5	5

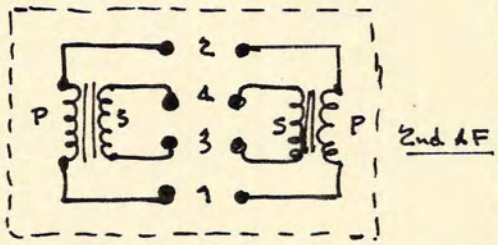
RFC should be suitable for broadcast band.
Unit requires a separate Plate and Filament supply - not to be taken from power circuit of receiver.

RCA SHORT-WAVE RECEIVER, Model AR-1145,



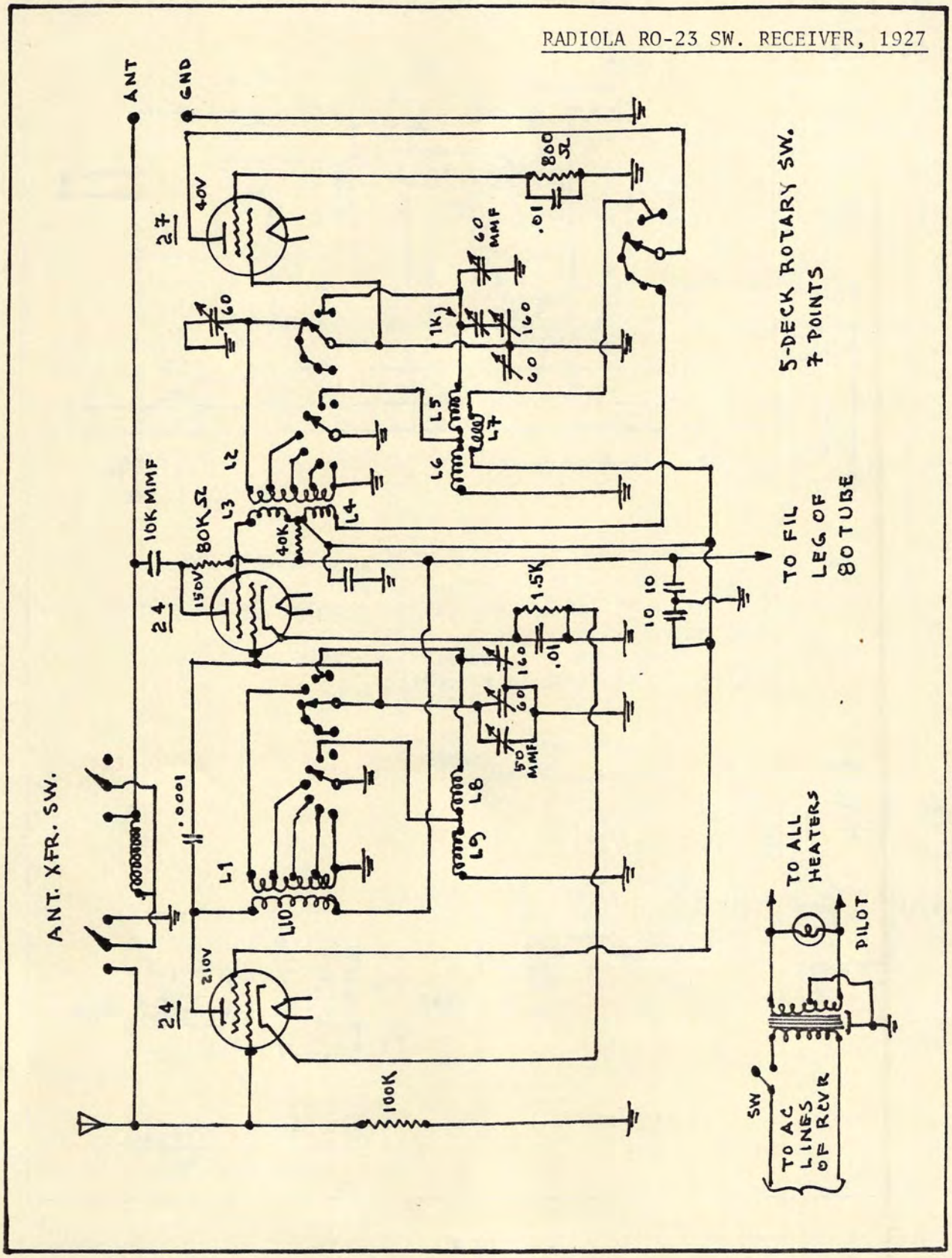
550KC - 20,000KC. This was a regenerative battery type.
1st AF output jack omitted from diagram above for clarity.
Some units had an RFC in the ANT circuit instead of the 2K-Ohm resistor shown.
Coils were plug-in type. Chassis was COMMON.
The 50K pot. was the "Intensity" control.



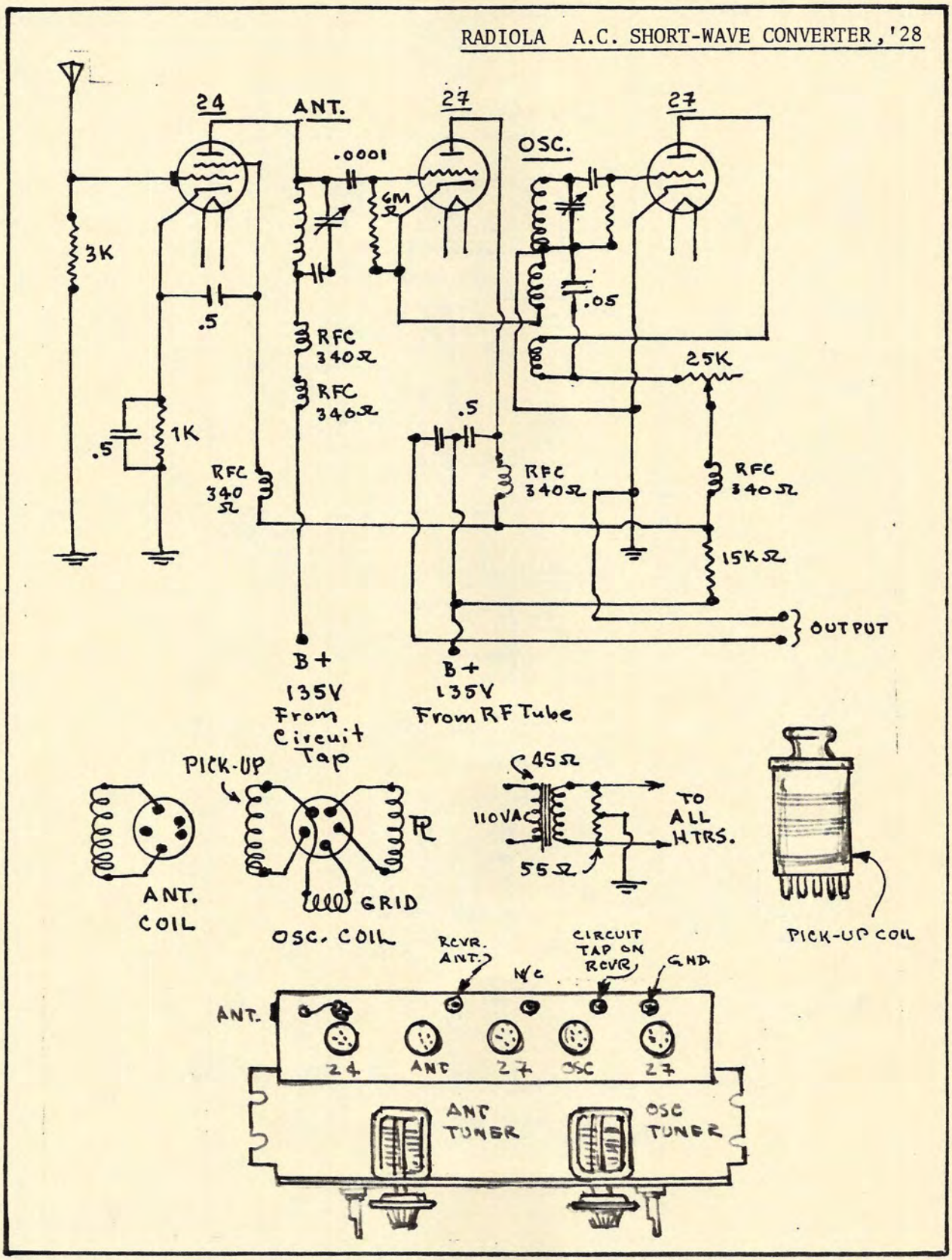


AF XFRMRS. INTERNAL CONNEXIONS

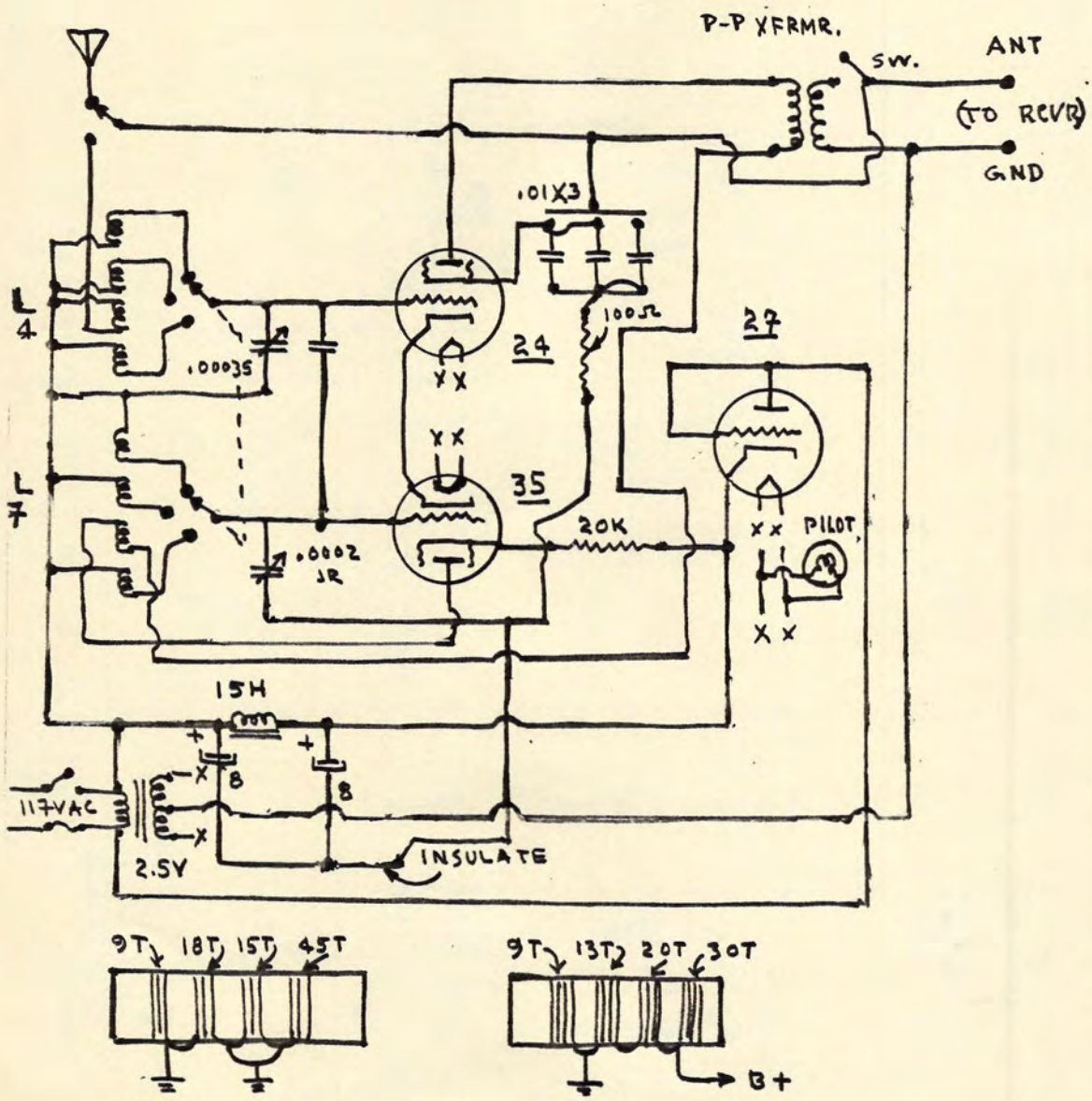
RADIOLA RO-23 SW. RECEIVER, 1927



RADIOLA A.C. SHORT-WAVE CONVERTER, '28



RADIO WORLD SW. CONVERTER, 1928

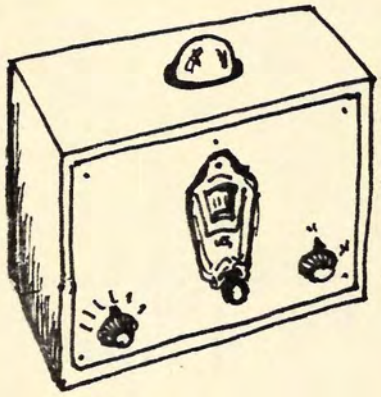


L4= Modulator Coil

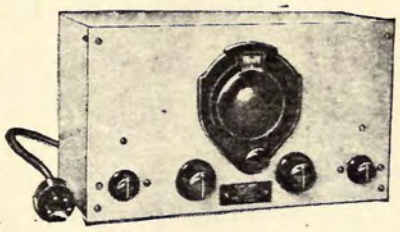
L7 = Oscillator Coil

NOTES:
1. Coil form = 1.124" Ø; #28 enamelled wire.
2. 2.5 VAC filament transformer.
3. 2-Deck, 3-position rotary switch.
4. SPST switch; P-P switch.

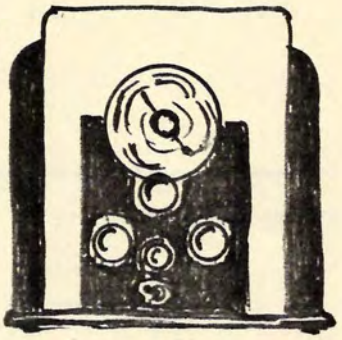
RIM "EXPLORER" SW. CONVERTER SERIES



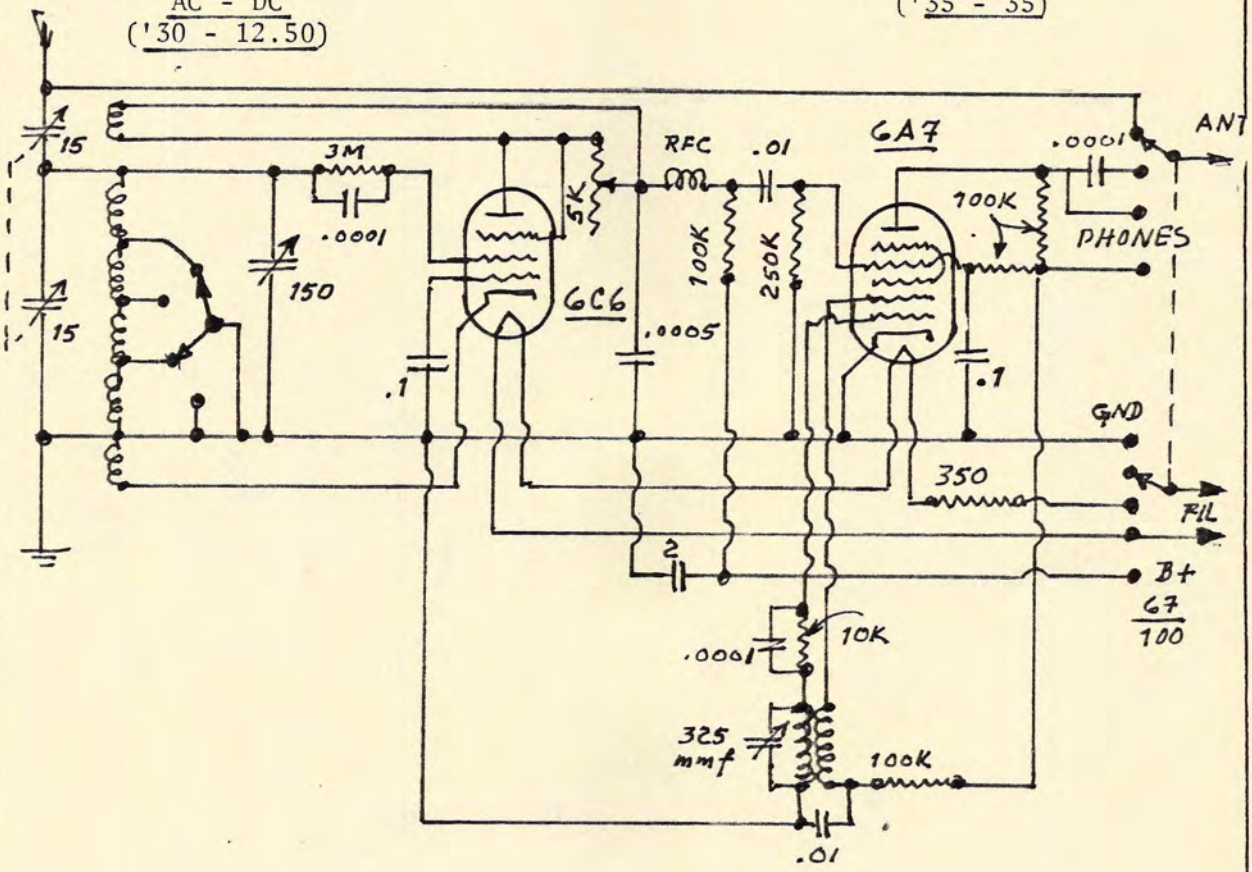
1st Version
AC - DC
('30 - 12.50)



2nd Version
15-160 M.
('33-25)

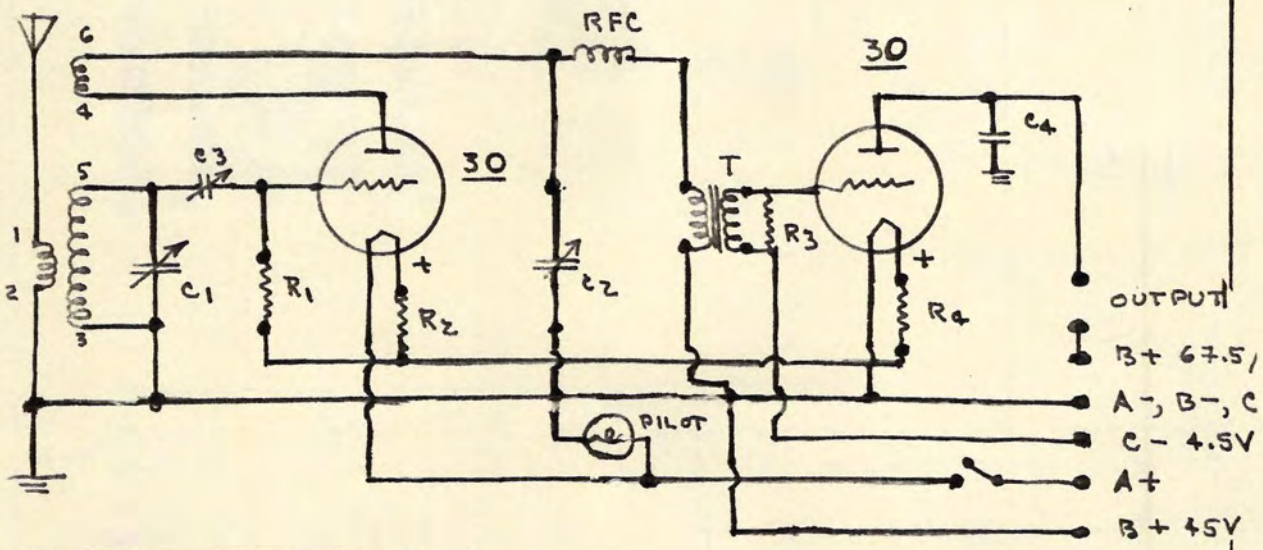


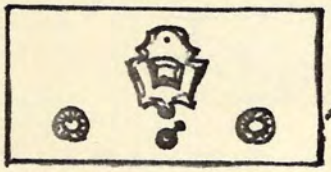
3rd Version
('35 - 35)

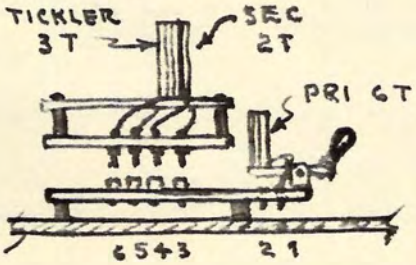


NOTES:
1. Oscillator permanently tuned to one frequency;
2. AF output of DET used to modulate the fixed "carrier".
3. The 1935 version range was 15 to 200 meters.

R.N. SHORT-WAVE RCVR., 1930



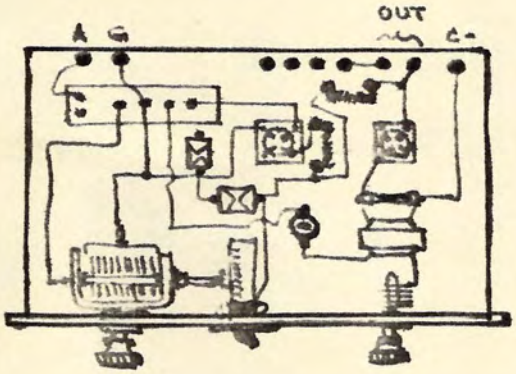




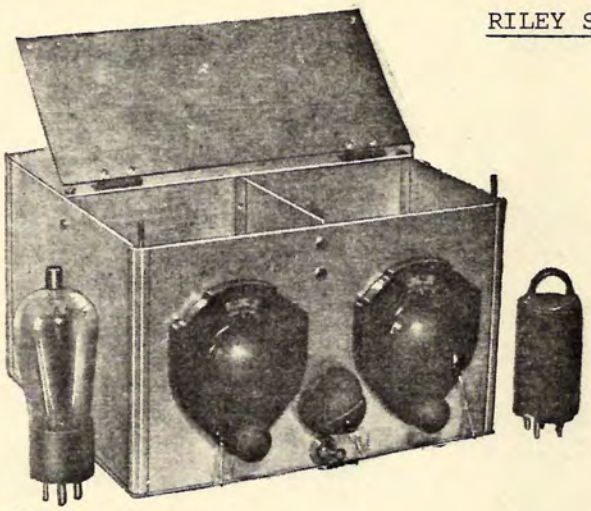
C_1 = 125 mmfd Varrable
C_2 = 100 " "
C_3 = 20-100 " "
C_4 = .001 mfd, fixed
R_1 = 3M Ω Grid-Leak
R_2 = 65 Ω
R_3 = 100K Ω
R_4 = 65 Ω
T = AF X frmr. 4:1
Pilot Lamp = 2V (?)
RFC = 85 mH

FIL Resistors are in POS leg.
Drum-Dial on C_1.

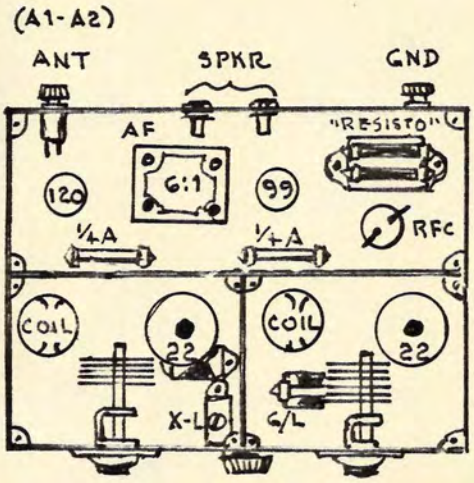
Al. shield placed behind panel, in front of C_1.



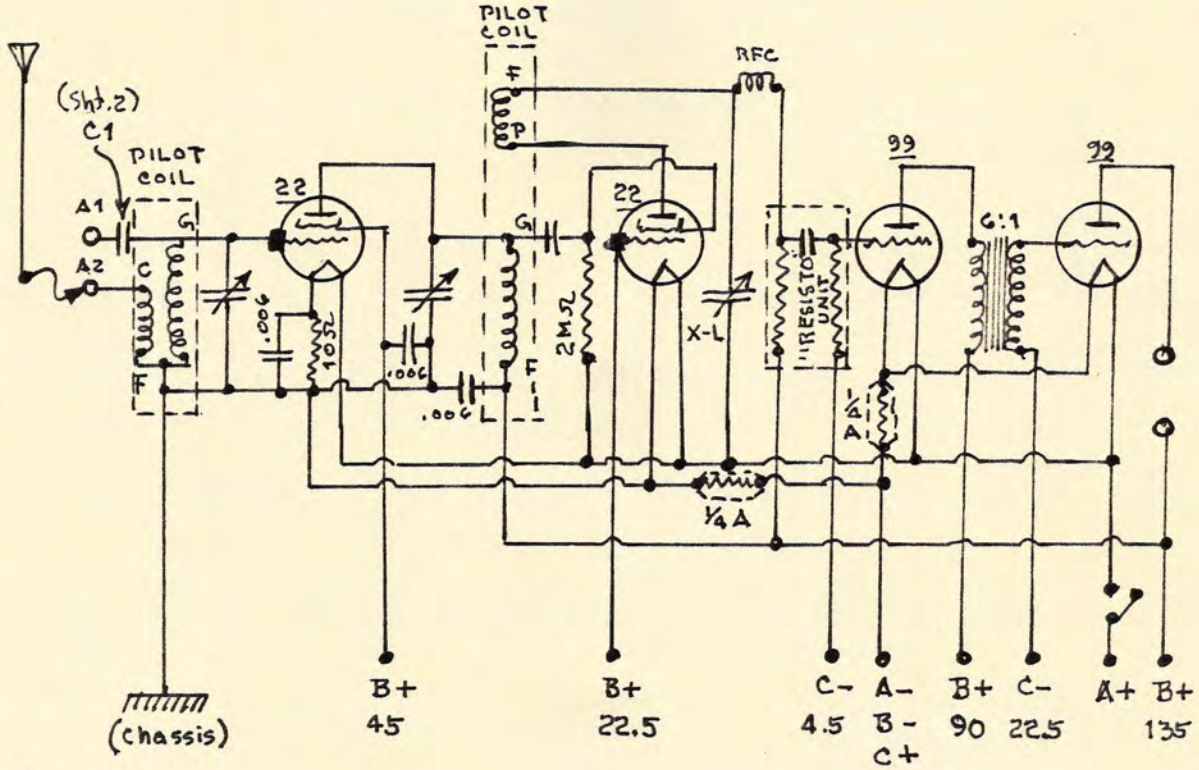
RILEY SHIELDED SW. RECEIVER, 1928: Sht. 1



(Also known as "Autodyne.")

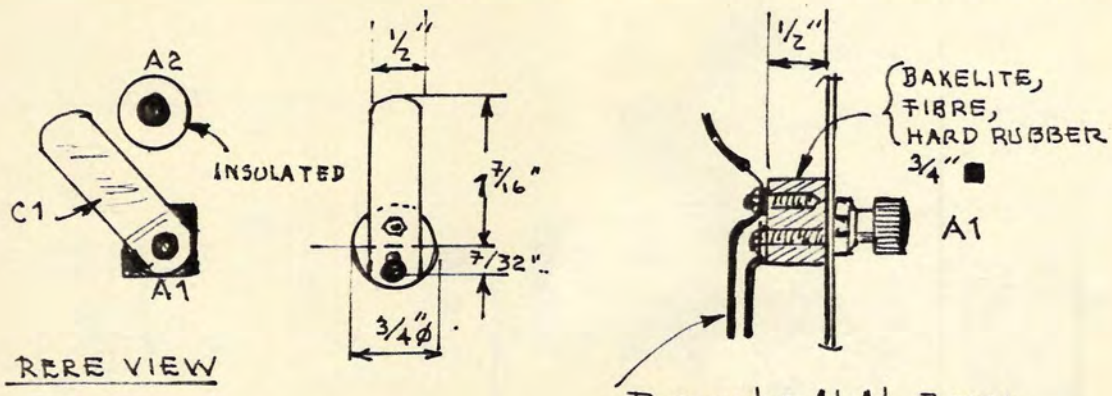


NOTES:
1. ALCOA
Shield Can 8½"x7¾"x5½"
2. (2) ANT Binding Posts.
3. Midget Variables, 100 mmf.
4. "PILOT" Coils Modified to Suit.



(RN 4-29)

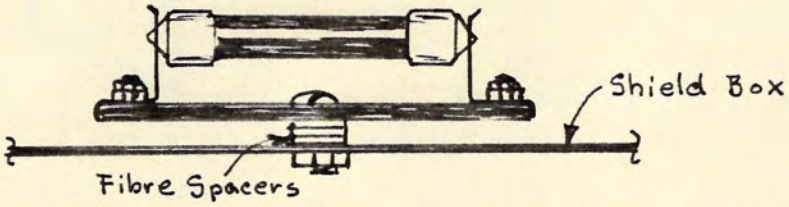
RILEY SHIELDED SW. RECEIVER, 1928; Sht. 2



REAR VIEW

R may be Al. Al., Brass, or Copper, 1/32" Thick.

DETAILS of C1 (Sht. 1)



AMPERITE Mountings - must be kept from touching Shield Box.

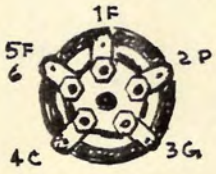
RANGE = 17 to 203 Meters.

A & B Eliminators should not be used; use Batteries.

If 01A's are used in AF stages, change Amperites to suit.

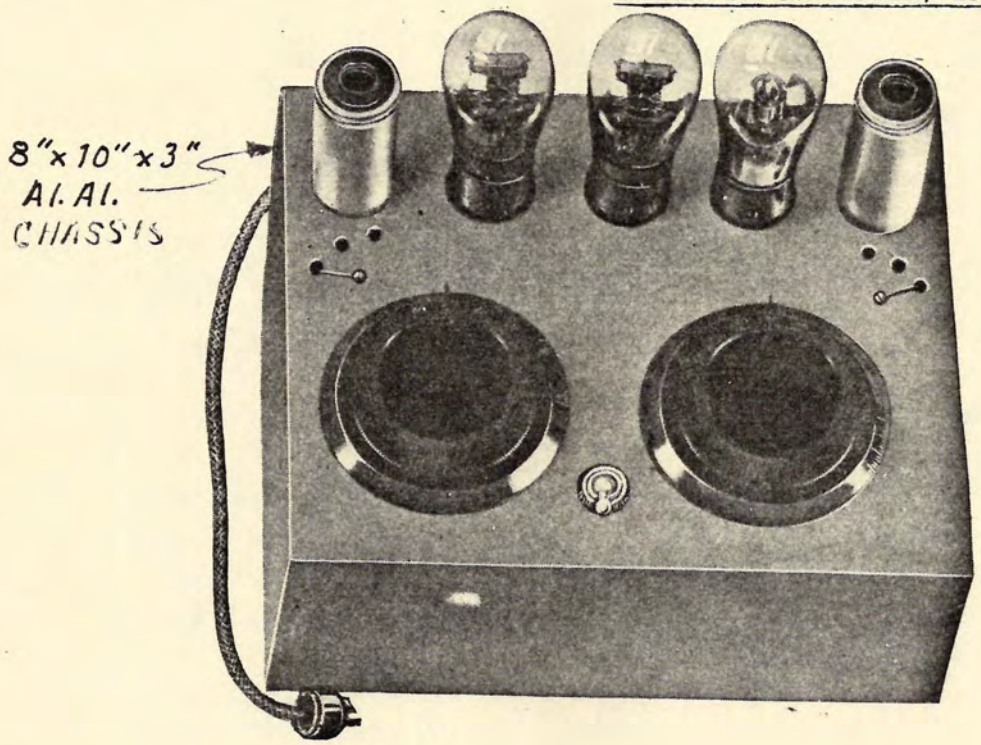
COIL DATA

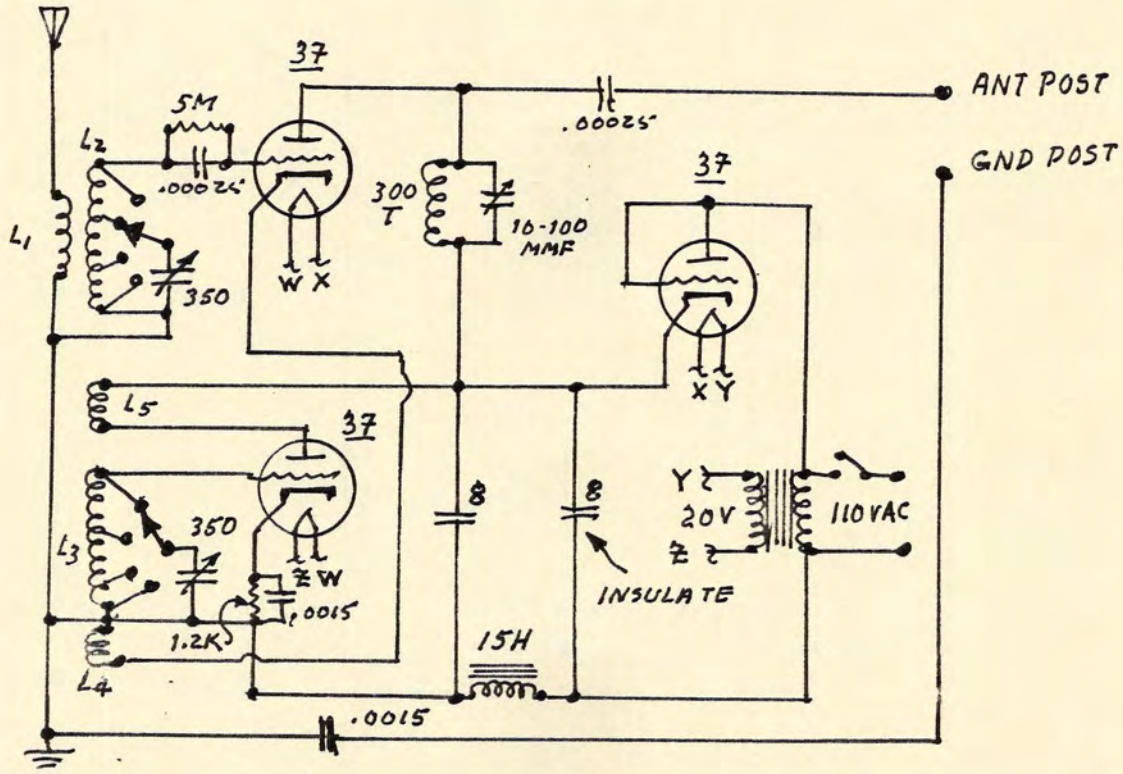
COIL	RANGE	PRI	SEC	TICKLER	WIRE
A	17-30	2T	3½T	5T	+24 DSC ↑
B	30-52	2T	7T	9T	
C	48-105	3T	18T	10T	
D	93-203	4T	44T	17T	



Bottom View of Coil Plugs (2 Sets Req.)

ROLAND SW CONVERTER, 1930; Sht. 1





ROLAND SW CONVERTER, 1930; Sht. 2

COIL DATA: - 350 mmf Variables.
FORM = 1.125"ϕ. #28 Enamelled Wire
MOD: ANT = 10T (PRI)
SEC = 33T, Tapt @ 22nd & 26th turn.
OSC: SEC = 25T, Tapt @ 13th & 18th turn.
TP = 20T, Spaced close to pick-up winding.
PICK-UP WINDING = 10 Turns (between TP & G).

BAND-SWITCHING:

This was a novel method & should be studied carefully. Two 5-prong wafer tube sockets are attached to the underside of the top panel. Their GRID springs wired to respective stators.

The tapt coils are then wired to the other spring-contacts, making certain each lead coincides w/ the same lead of the other coil – i.e., #1 tap from ANT coil going to spring-contact normally used for TP should be followed by #1 tap from OSC going to TP contact-spring of the second wafer-socket, etc.

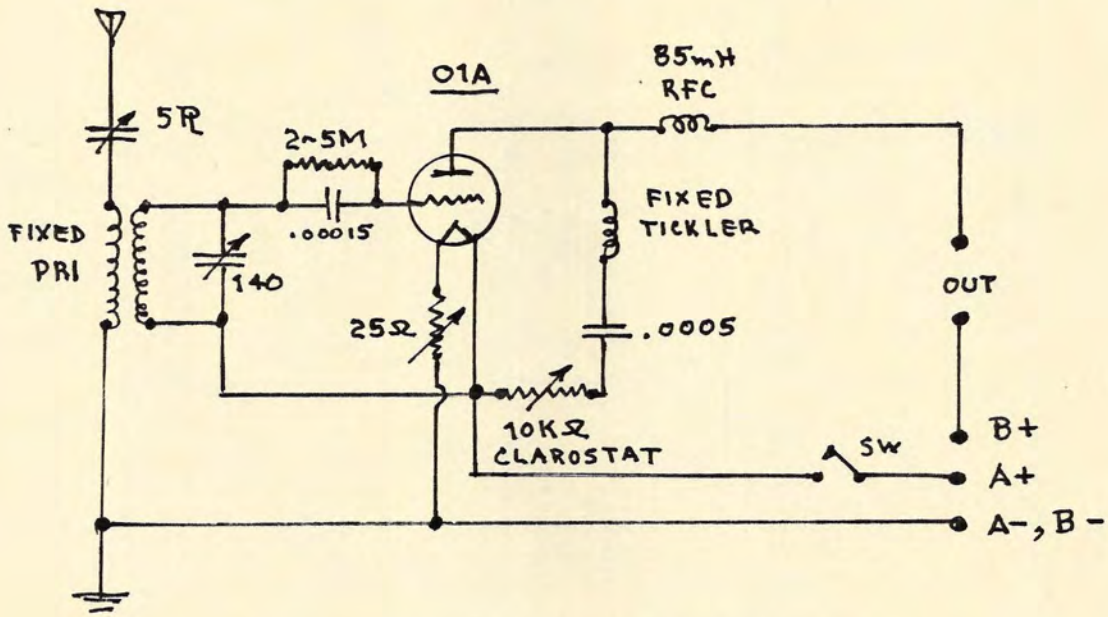
A flexible lead w/a tip is brought in through the top panel near each coil, & the free end soldered to the GRID spring of the wafer-socket. The tip is inserted into the wafer-socket holes to change the band range.

CAUTION
Each tipt flexible lead must coincide w/ the other as to which prong-hole is being used.

NOTE: An aluminum chassis is shown; unit may be built in a wood box w/ Bakelite panel, using the same dimensions.

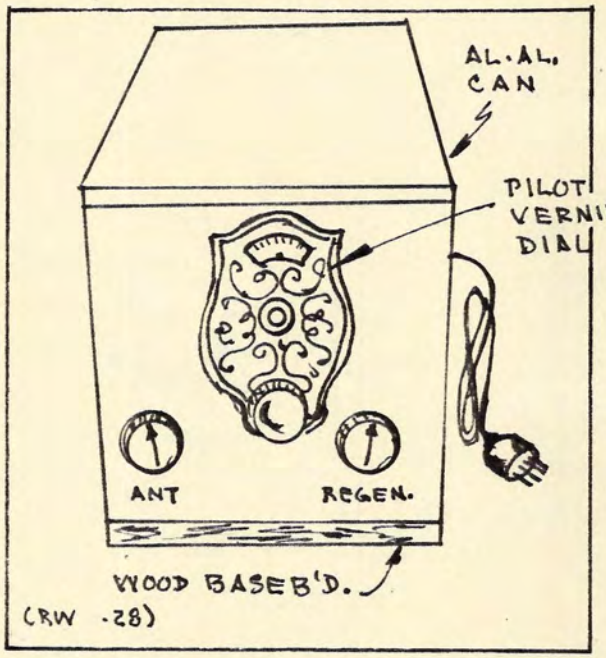
(RW 12-12-31)

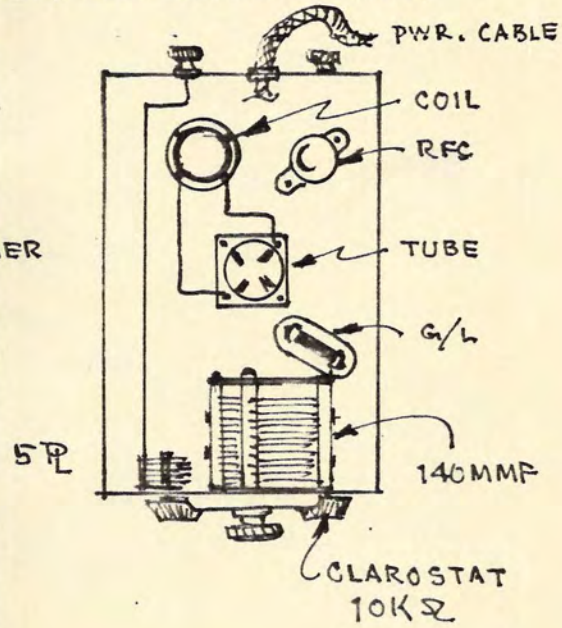
RUGGLES SHORT-WAVE ADAPTER, 1928

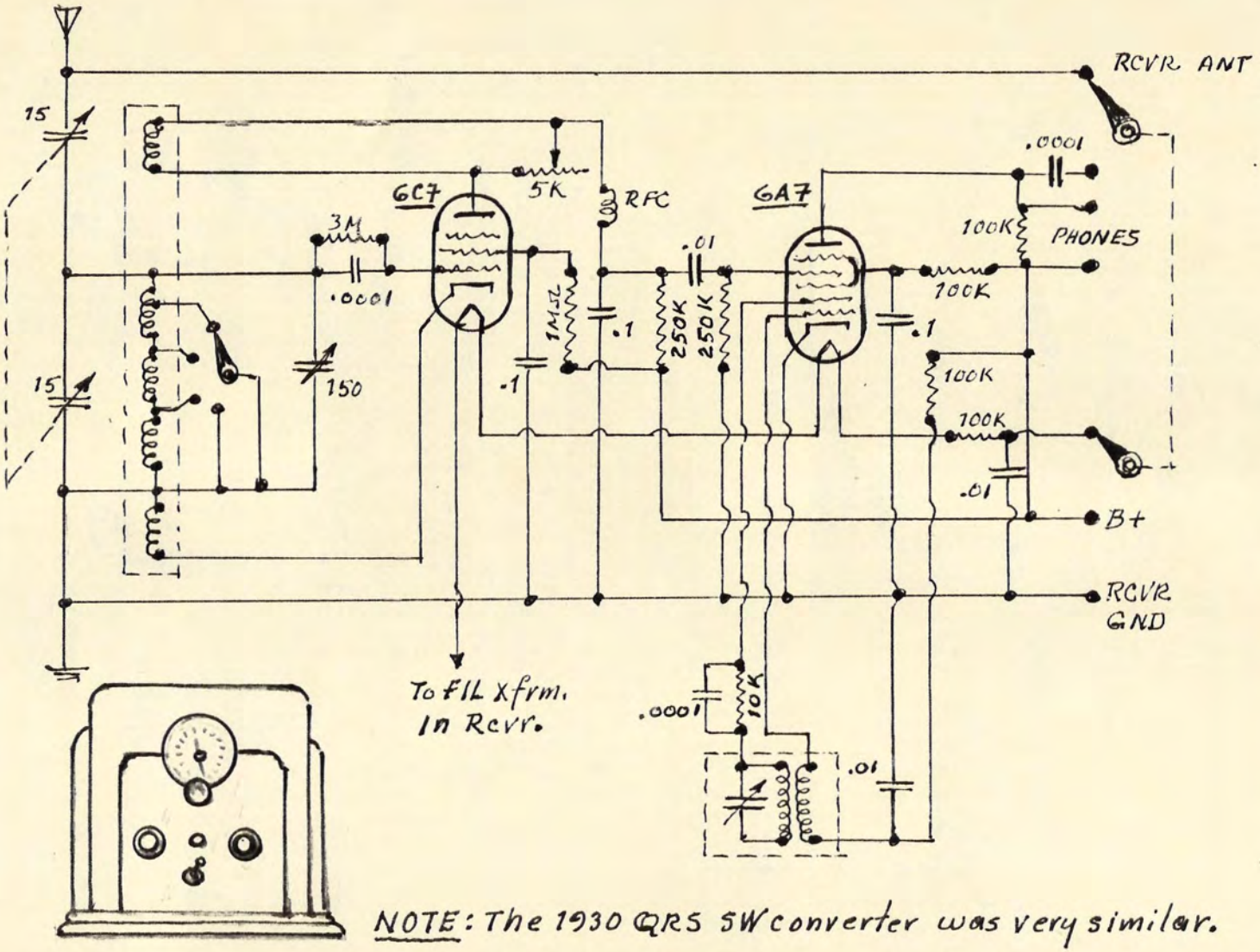


3-Winding Coils w/ Fixed TICKLER & PRI.
4 Binding Posts.

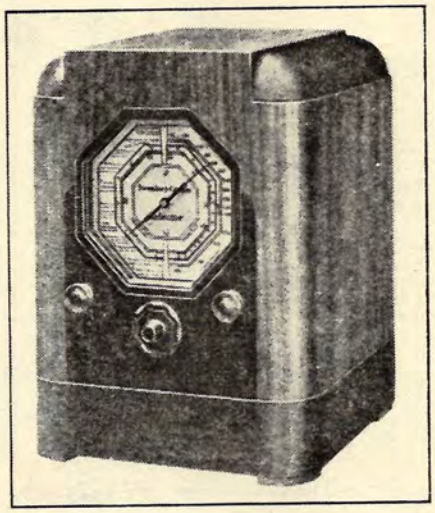
If unit oscillates at all settings of the Variable with FIL rheostat at "O", and at no setting with rheostat at MAX., all values are correct.





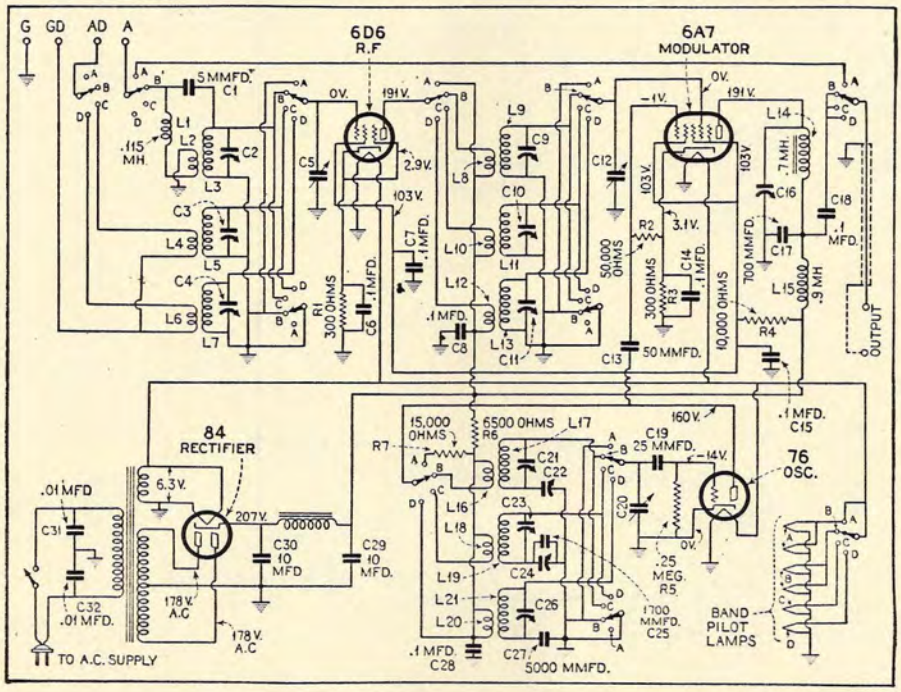


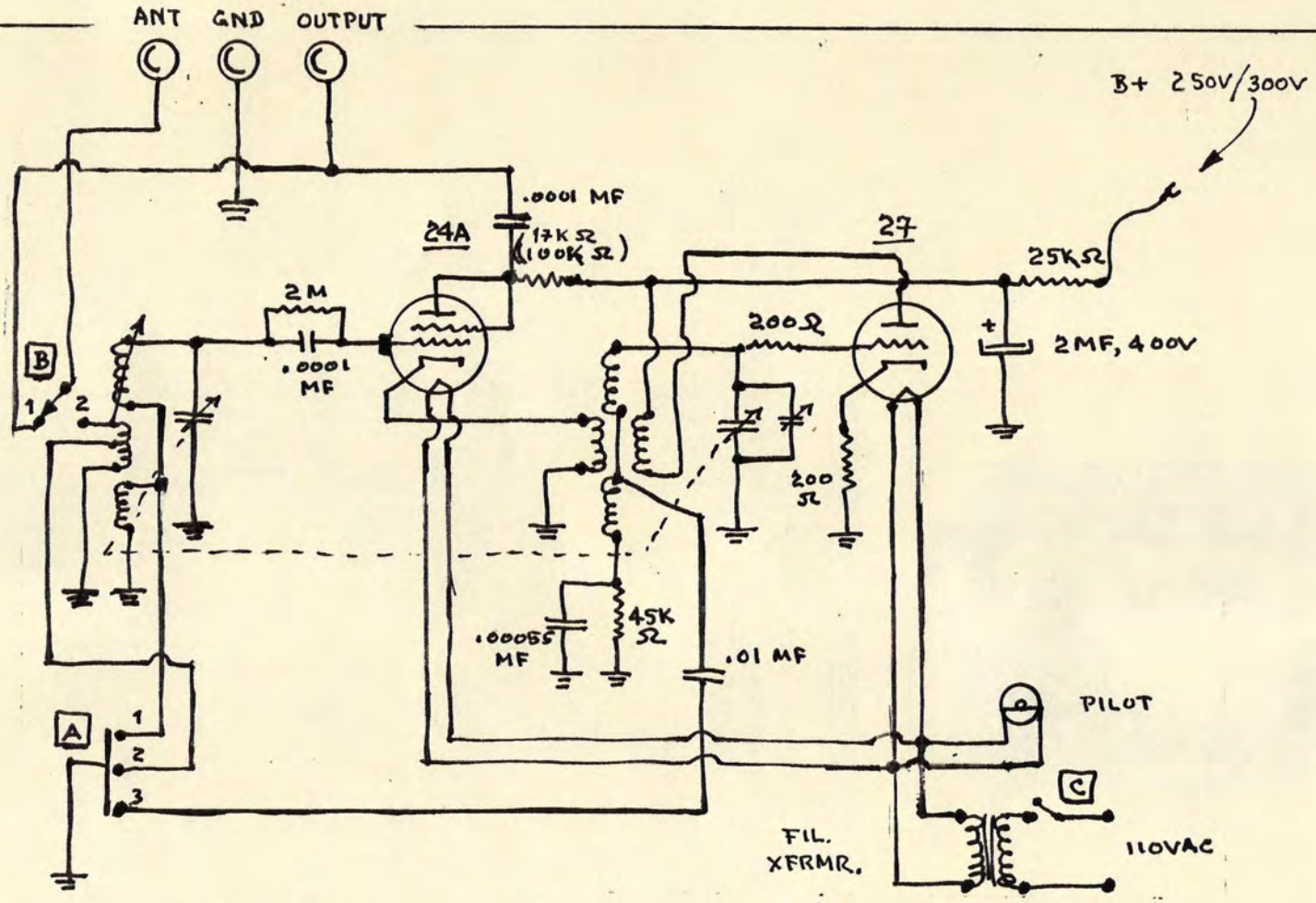
NOTE: The 1930 QRS SW converter was very similar.



STROMBERG-CARLSON Model 69, 1934

Of all the short-wave converters and adapters I have collected or constructed, the Model 69 SW converter, and receiver by Stromberg-Carlson remains with no contest the most superior of them all. Enclosed in a solid mahogany two-tone cabinet and a black Bakelite face-plate, the I.F. was 545 KC. The diagram below depicts the original circuit.





STEWART-WARNER SW. CONVERTER, 1929
(Model 301-A, -B, -E; Chassis 67656)
(Sht. 1)

NOTES:
1. Switch Positions: (A) = OFF in Positions 1 & 2 of Selector Switch; ON in position 3. (B) = OUTPUT terminal in position 1; to coil in positions 2 & 3. (C) = OFF in position 1; ON in positions 2 & 3.
2. Converter is cut out of rcvr. circuit when switch (B) is in position 1 and switch (A) is in position 1 or 2. Switches (A) & (B) are one unit.
3. Performance may be improved by substituting a 10K resistor for the 45K, & inserting a variable 50K resistor for the 100K.
4. Original model number was R-301-A.

STEWART-WARNER SHORT-WAVE CONVERTER, 1929
Model R-301-A (Sht. 2)

IF UNIT IS INOPERATIVE...

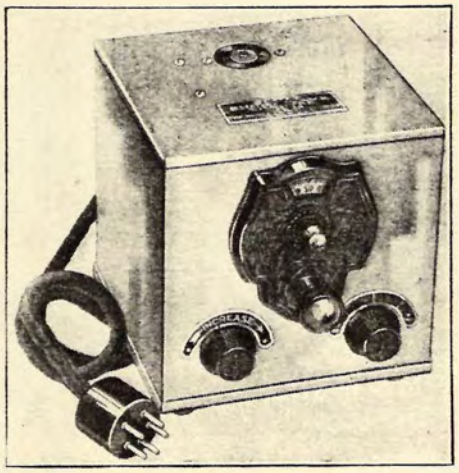
1. Plate voltage on the 27 is too low; it must be in excess of 100V. If below 1ooV, remove 17K series-resistor in RED plate lead entirely - or substitute one of a lower value to suit 100V.

2. Resolder all connexions to coil and other high-frequency connexions.

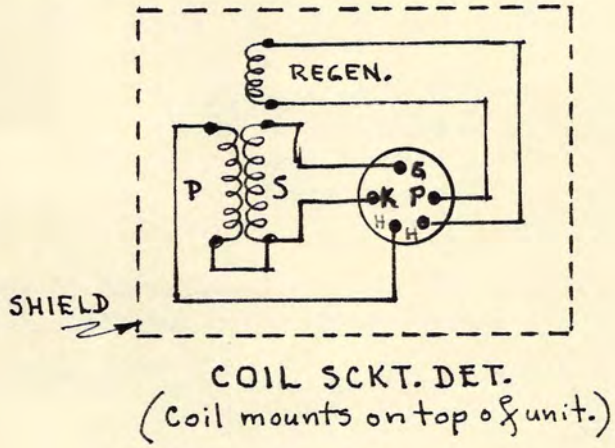
3. Check for a leaking 1 MFD,400V plate by-pass, connected between 25K,1W plate-supply resistor and grid. Replace with 2 MFD, 600V unit.

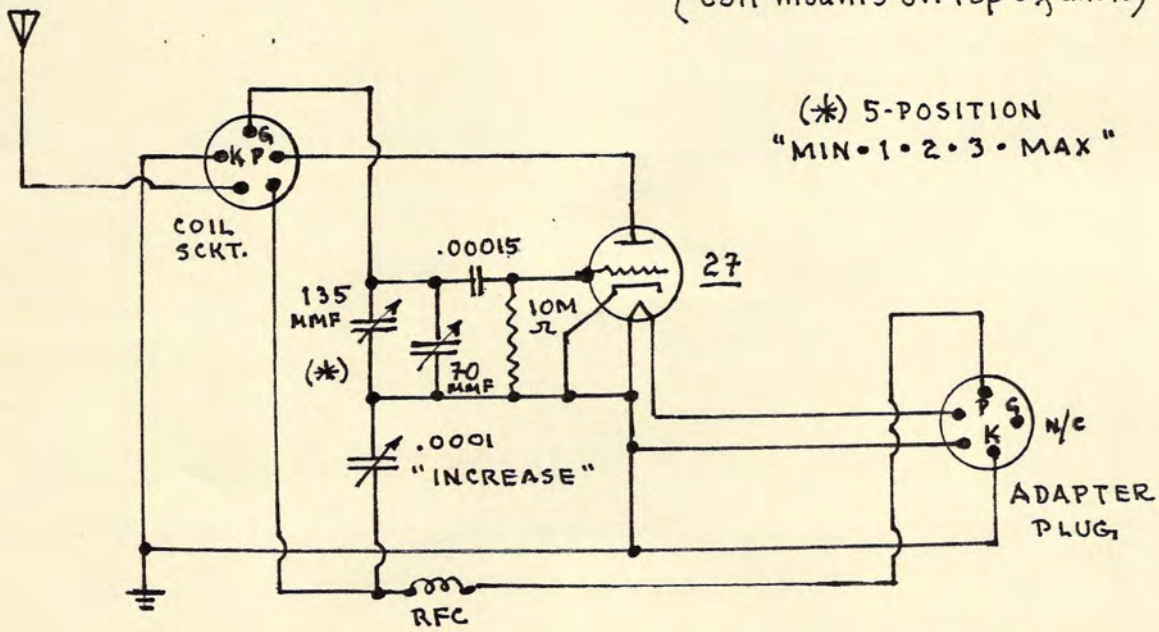
4. Check for a faulty 2 MFD by-pass located directly below the ganged variables; replace with the dry electrolytic type.

5. If dial slips, twist a thin rubber-band around each rubber pulley.



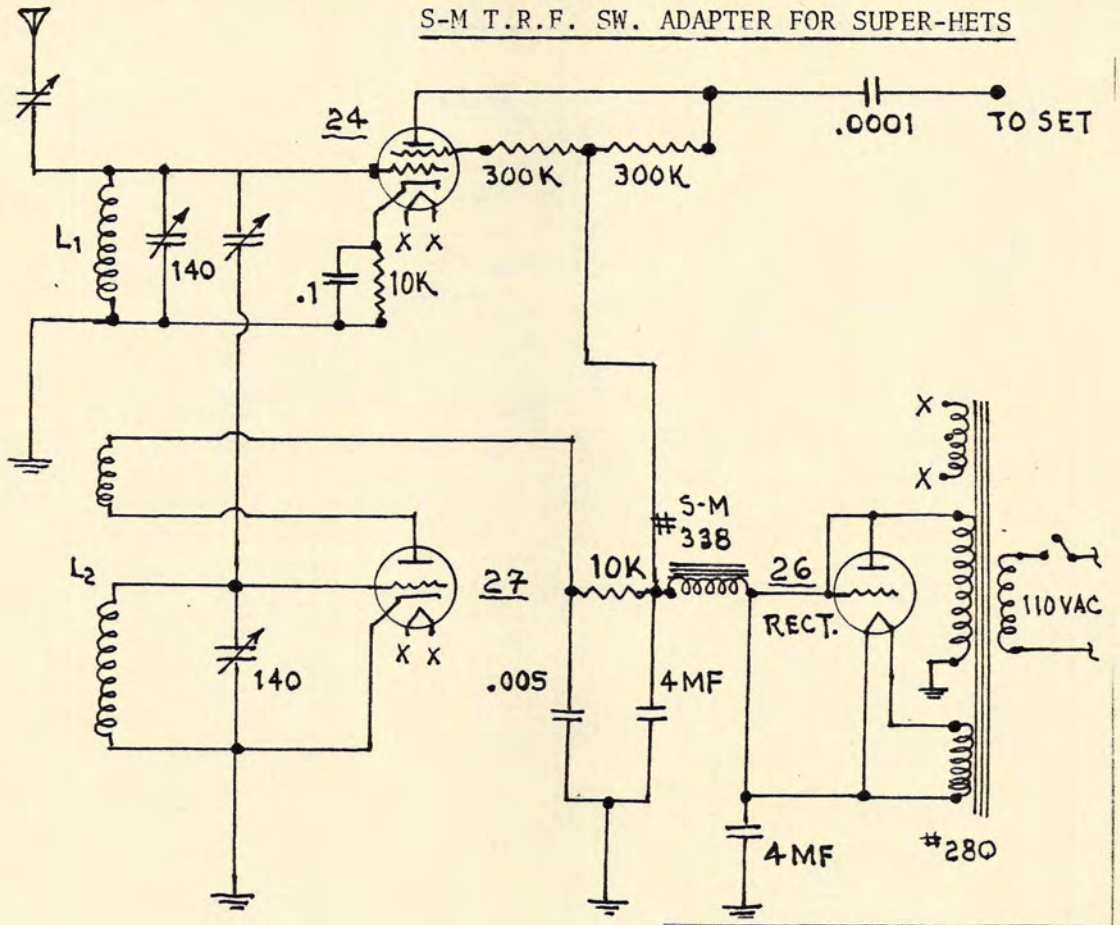
SCOTT SHORT-WAVE CONVERTER, 1929

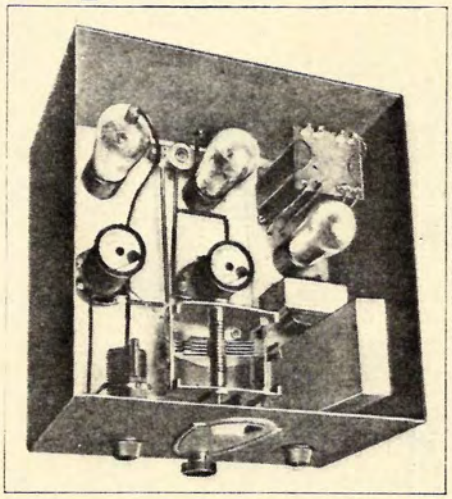




NOTES:
1. Remove DET tube from set & place in converter from bottom.
2. Remove set OSC tube and lay aside.
3. Set dials have no effect on converter tuning.
4. Tune converter until rushing sound is heard; turn control down to just below point of oscillation.
5. "INCREASE" control is for converter volume.
6. Original Scott coils covered 15 to 93 meters.
7. Adapter plug goes into 1st DET socket.
8. Antenna for 14 - 26 meter coil was specified as 80'; antenna for all other coils = 100'.
9. Be sure to disconnect ANT and GND at receiver posts.

S-M T.R.F. SW. ADAPTER FOR SUPER-HETS



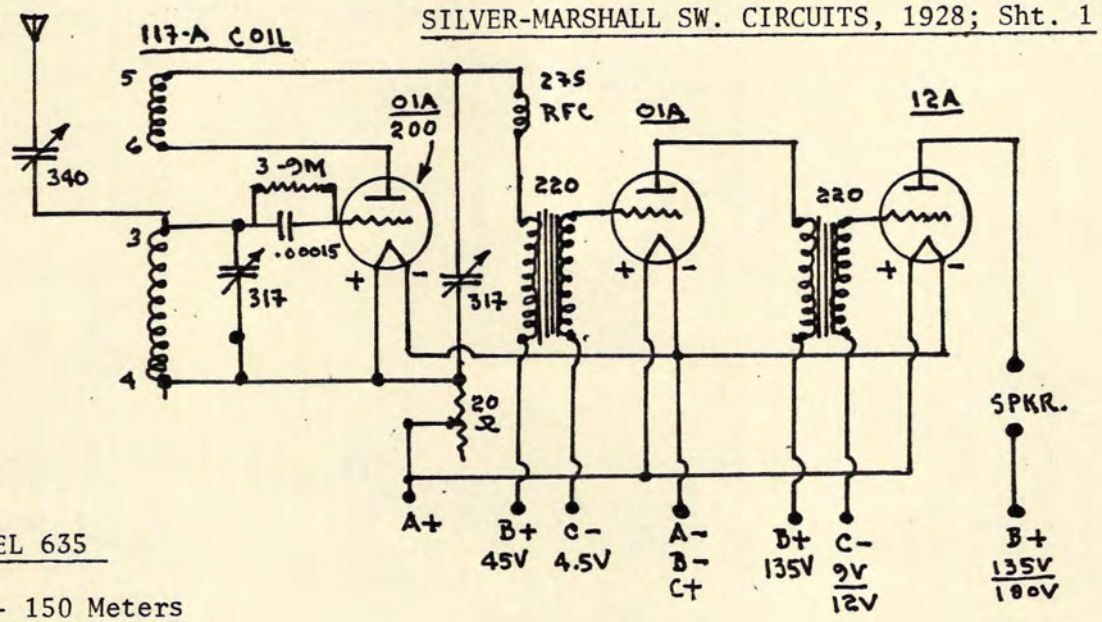


NOTES:

1. Model 738 & Shield Assembly.
2. L.H. Knob Controls Antenna.
3. R.H. Knob Is ON-OFF Switch.
4. Centre Knob Controls SW. Oscillator.
5. S-M Series 131 Series Coils Used.
6. National "E" Dial.
7. Set Tuning Dials Between 800 & 1,000 KC.
8. Tune Across SW. Bands With Adapter.

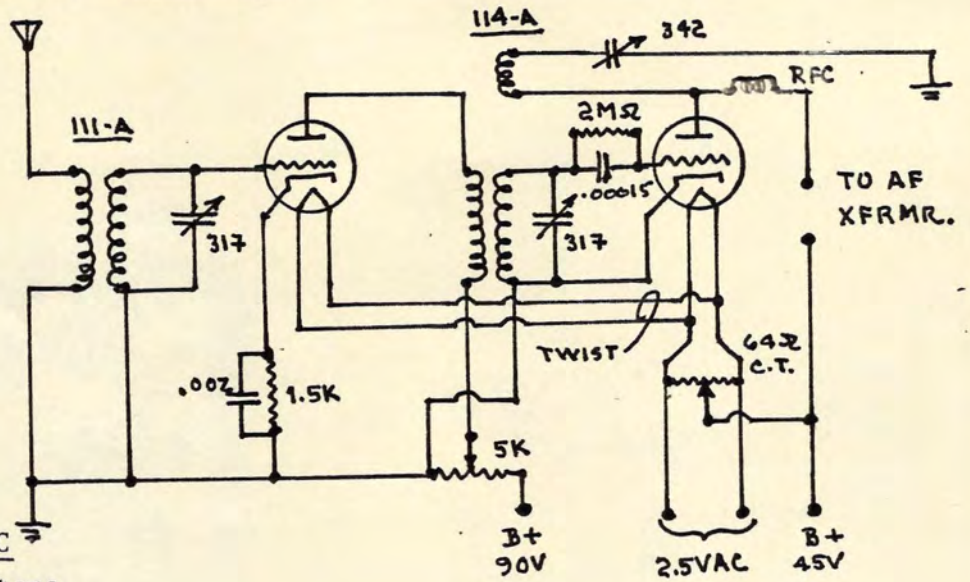
(RCB - 9-'30)

SILVER-MARSHALL SW. CIRCUITS, 1928; Sht. 1



MODEL 635

18 - 150 Meters



MODEL 642-AC

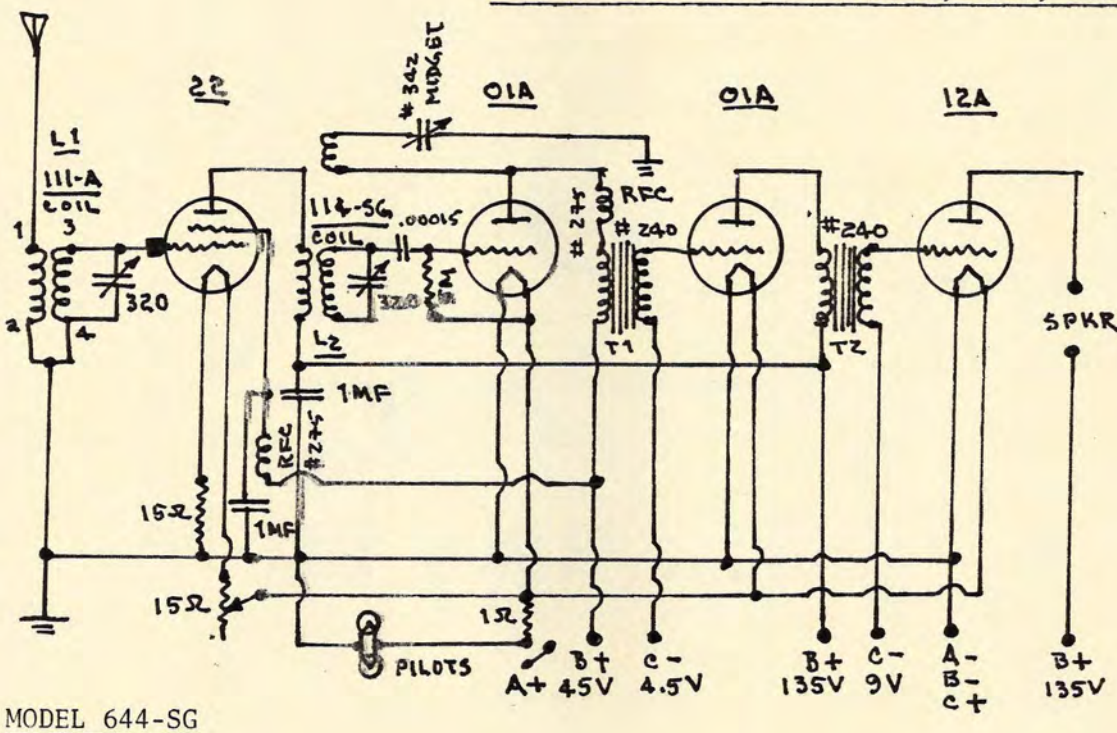
16 - 200 Meters

This model was also known as UNIVERSAL ALL-WAVE TUNER, available as Models 642 and 644 - i.e., in AC or SCREEN-GRID models; see following sketch.

Three diget numbers were S-M part numbers.

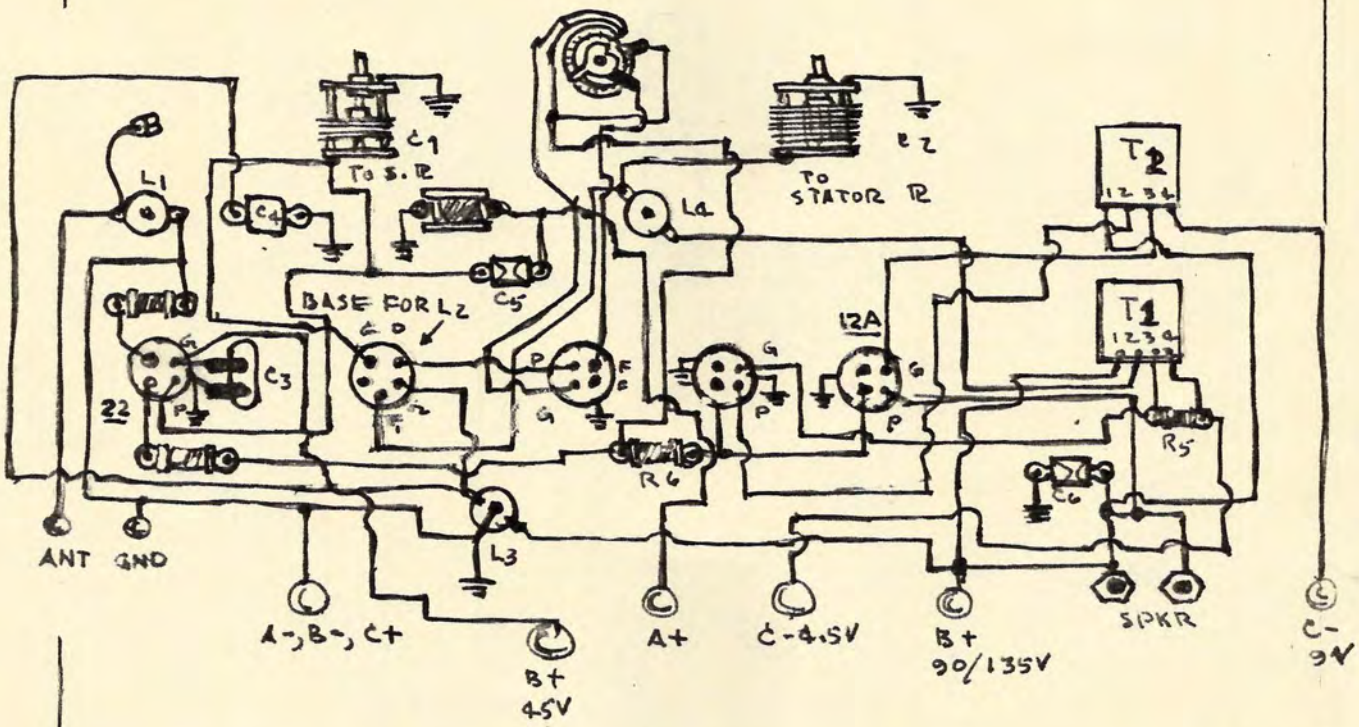
S-M RFC #175 = 75 mH.

SILVER-MARSHALL SW. CIRCUITS, 1928; Sht. 2

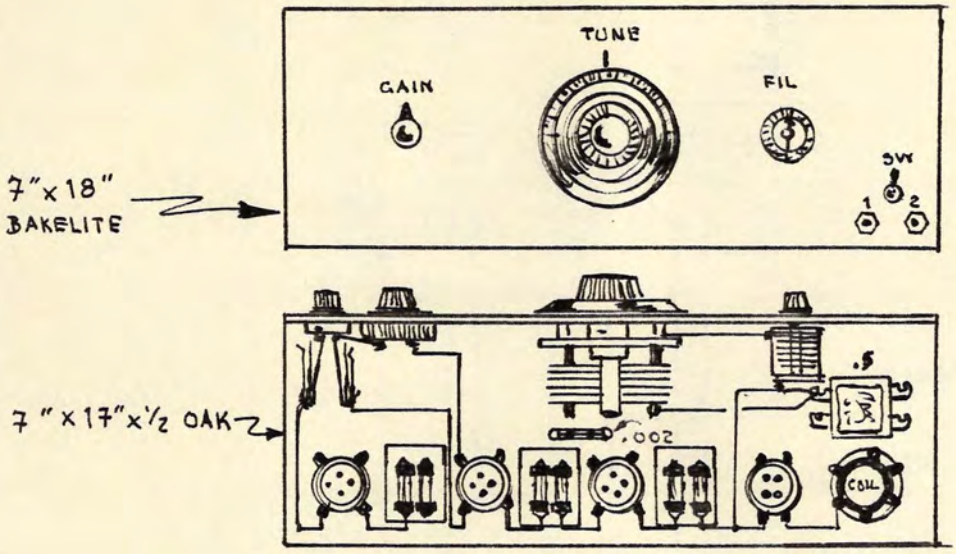


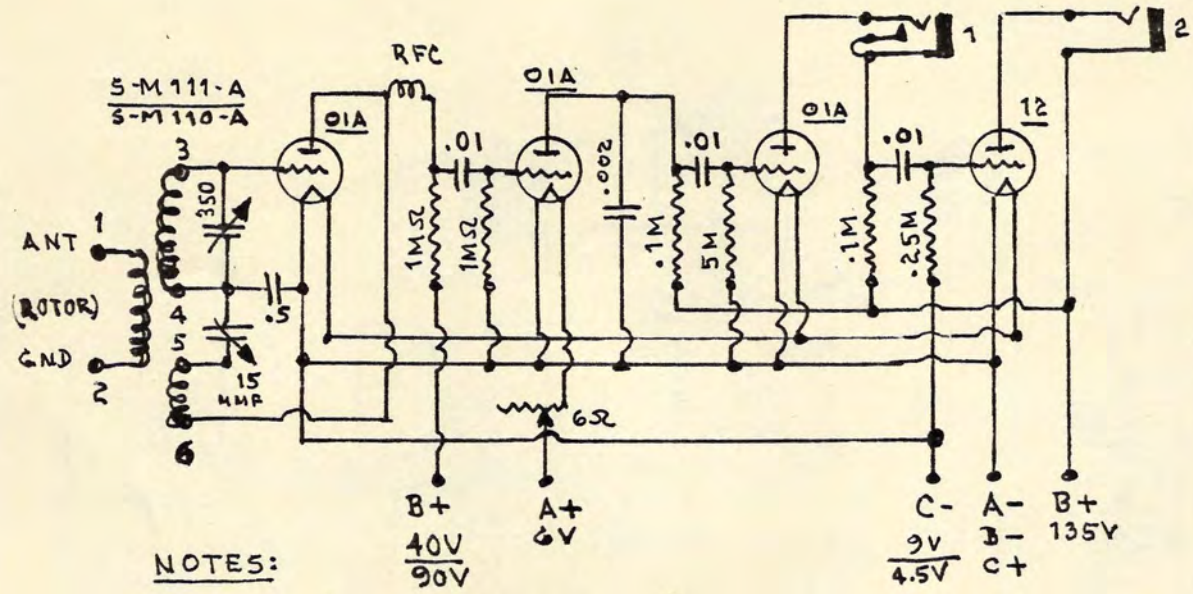
MODEL 644-SG

16 - 200 Meters



S-M ALL-WAVE "REGENERATOR", 1926



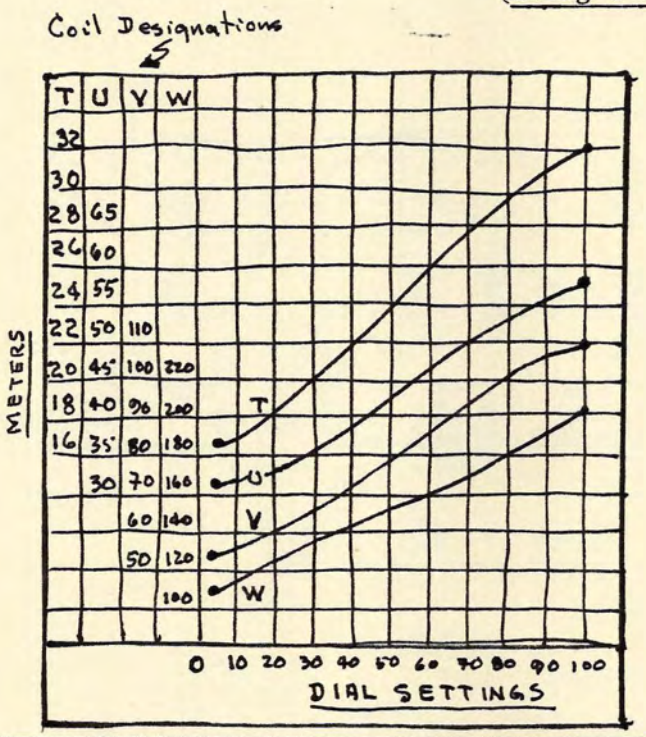


NOTES:

1. (3) DAVEN "RESISTO-COUPLERS".
2. 12" SQUARE BUSS-BAR REQUIRED.
3. RFC MAY BE 300T, #32 DCC, 1" Ø; (or) S-M, B-T, AERO, RFC.
4. 15 MMF MIDGET VARIABLE MAY BE SUBSTITUTED BY A 25KΩ POT ACROSS WINDINGS 5 & 6 OF COIL.
5. COIL HAS ADJUSTABLE ROTOR FOR ANT. (1 & 2 TERMINALS).

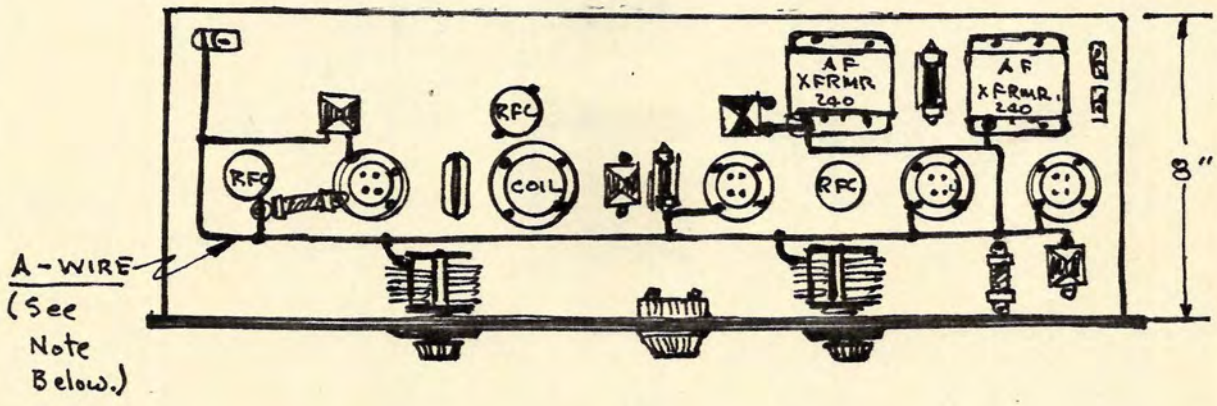
(RW 3-27-26)

CALIBRATION OF S-M SW. COILS, 1928
(Using 0-100 Dials, Left to Right)



S-M Series # 131 Coils.

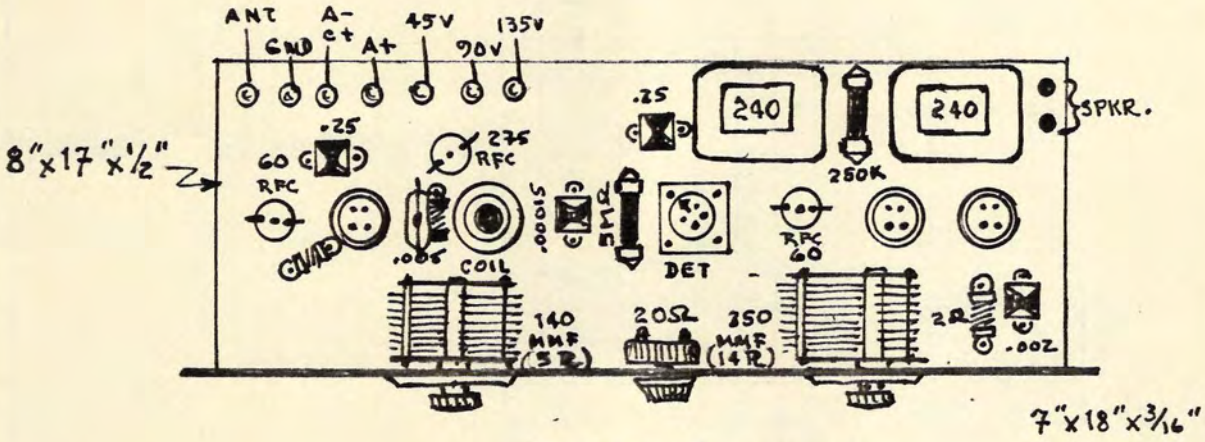
S-M. R.T.W.4 SW. (See Overleaf).



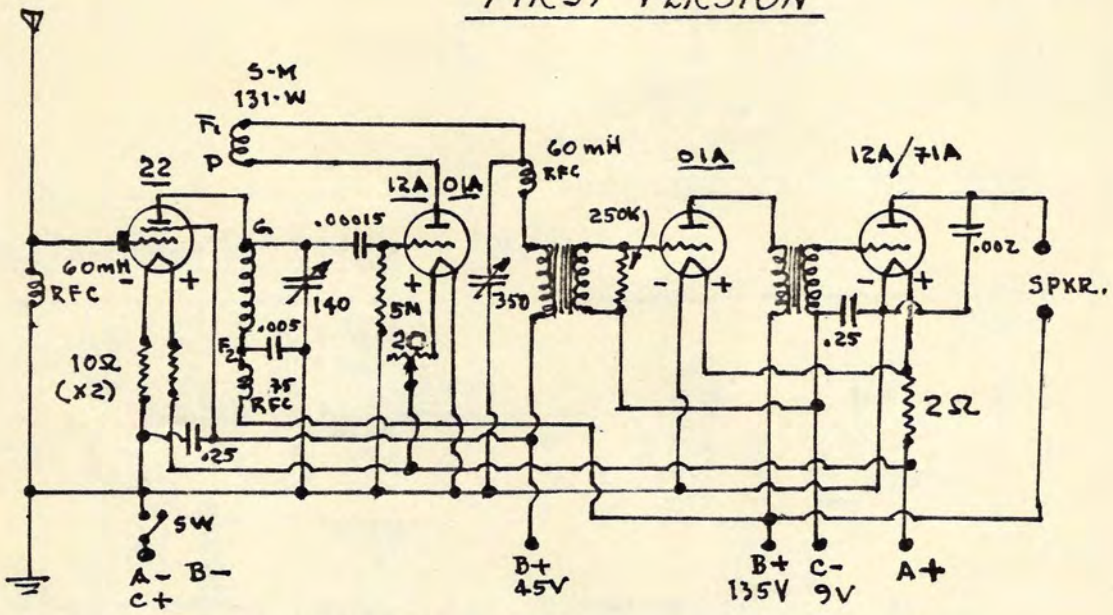
Heavy A- wire serves as common ground lead, to which transformer and condenser frames are tied. Heavy leads in detector-grid circuit must be short and direct.

S-M R.T.W.F. SW RECEIVER, 1926/1929

(Sht. 1)



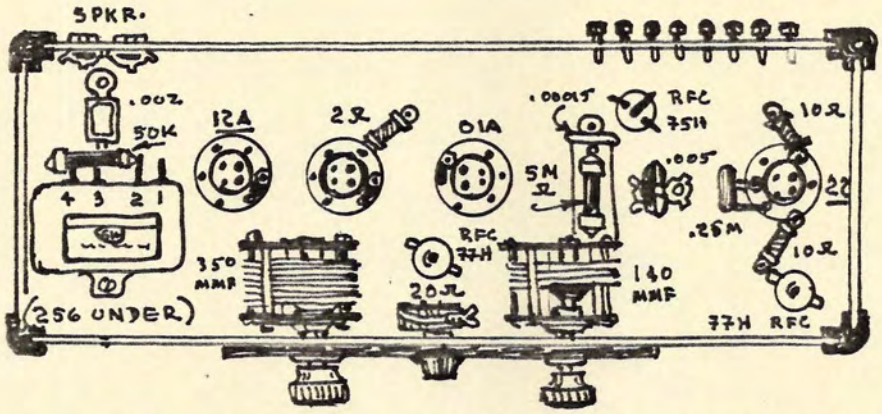
FIRST VERSION



131-A SERIES, 5-PRONG COILS.
AERO 60 RFC (2); S-M 275 RFC.
9 BINDING POSTS
MAR-CO DIALS
COIL ELEVATED 1" ABOVE BASEBOARD.
A- WIRE IS COMMON GND.
AF XFRMRS. SHELLS GROUNDED.

(RW 6-2-28)

S-M R.T.W.F. SW. RCVR., 1926-1929
(Sht. 2)



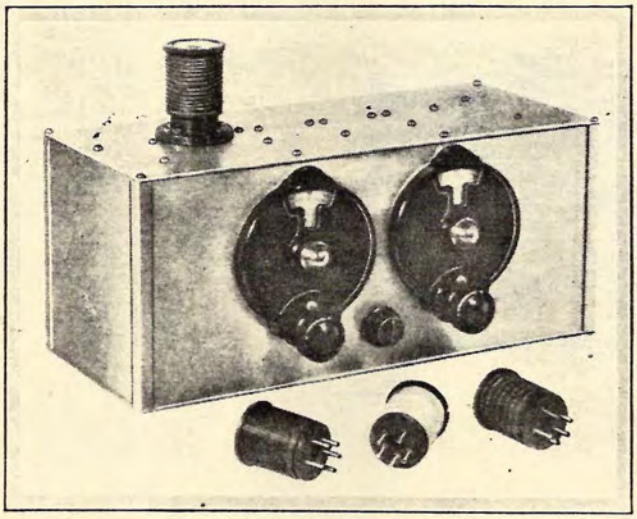
1929 ORIGINAL CHASSIS LAYOUT (See Overleaf)
(SCKT. FOR COIL MNTD. IN COVER) Model 730

COIL WINDING DATA:

1. 6.9T, #22 Enamelled Wire;
   5.5T, #34 DCC.
2. 13.5T, #22 Enamelled Wire;
   5.5T, #34 DCC.
3. 25.5T, #22 Enamelled Wire;
   9.5T, #34 DCC.
4. 49.5T, #24 DCC;
   15.5T, #34 DCC.

S-M 131 COIL RANGES:

T = 17.4 - 32 Meters
U = 31 - 58 "
V = 56 - 110 "
W = 105 - 204 "
X = 190 - 360 "
Y = 345 - 650 Meters



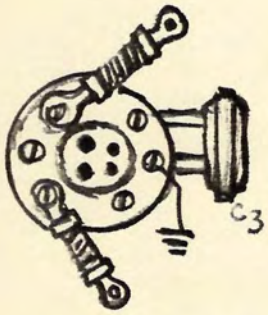
SILVER-MARSHALL SW CIRCUITS, 1926;Sht.4
("R-T-W-4" - 2 Versions)

NOTES ON 1926 VERSION:

S-M coils = 131 series, 5-prong sockets.
Variables = S-M #316A & #317.
Coil socket elevated 1" above chassis.
Panel = 7" x 18" x .125".

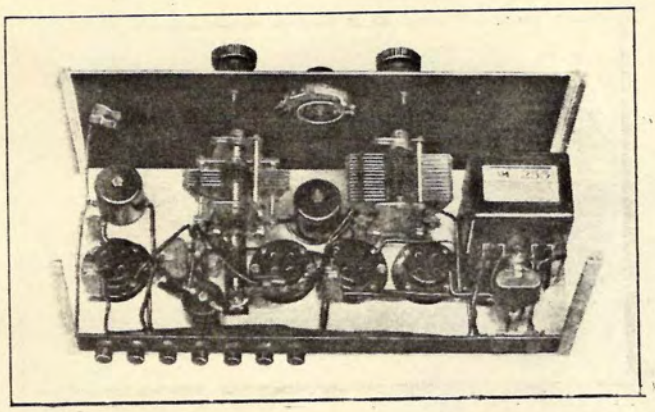
NOTES ON 1929 VERSION:

Aluminum alloy chassis, panel, cabinet.
Front panel = 14" x 6" (x 6" o/a).
(2) National "B" dials.
S-M #131 Series coils.
#18 gauge hook-up wire.
Switch is/was a Yaxley attachment.
Coil socket mounted in top of cabinet.
One AF xfrmr. mounted under chassis.

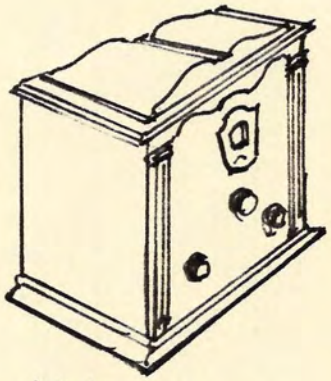


'22 TUBE SOCKET
ORIGINAL SM
CONNEKIONS

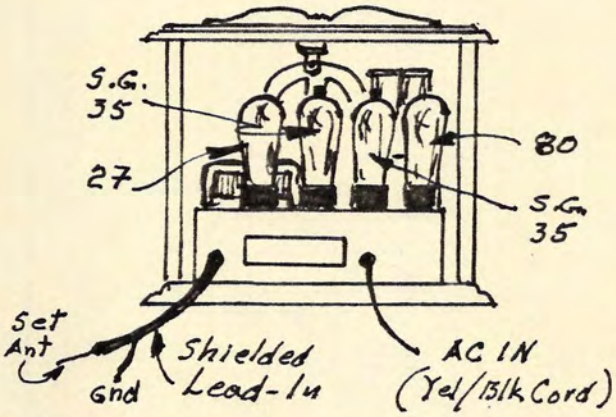
01A TUBE
SCKT. ORIGINAL
CONNEKION

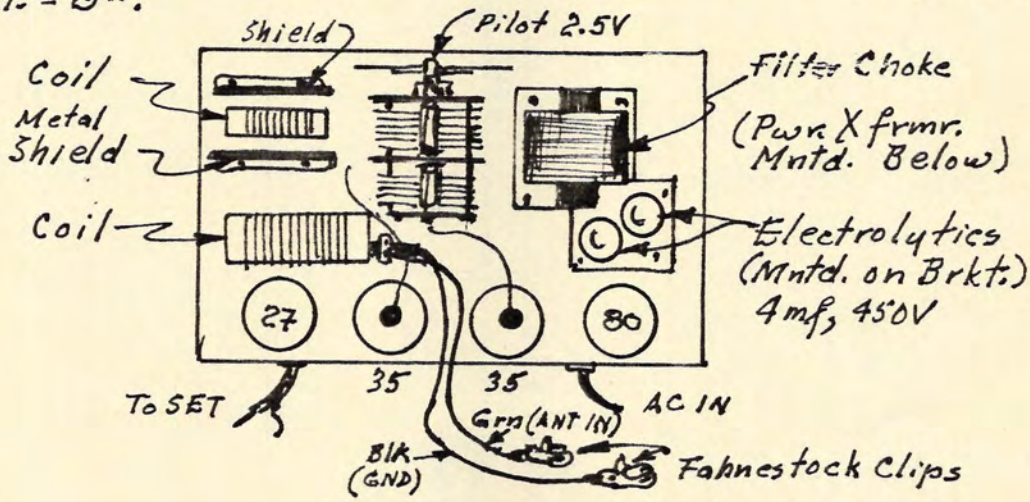


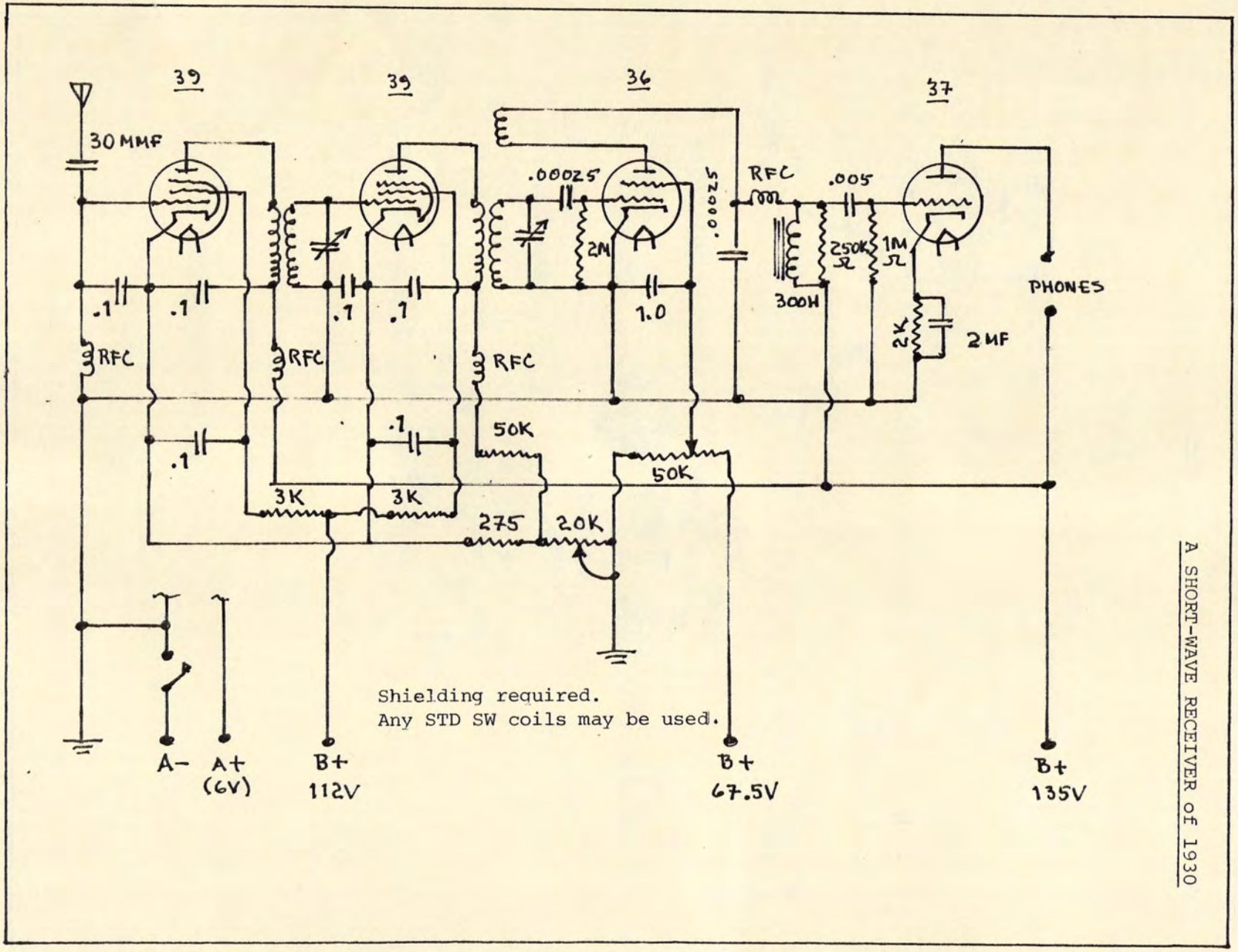
(Sht. 1) SEARS-ROEBUCK ("Silvertone") SW CONVERTER



Brown Mahogany
Cabinet - 10" x 10" x 8":
Wght. = 8#.

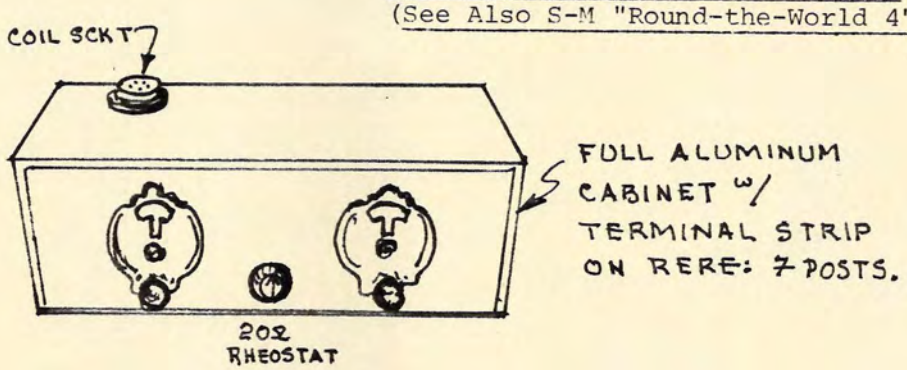


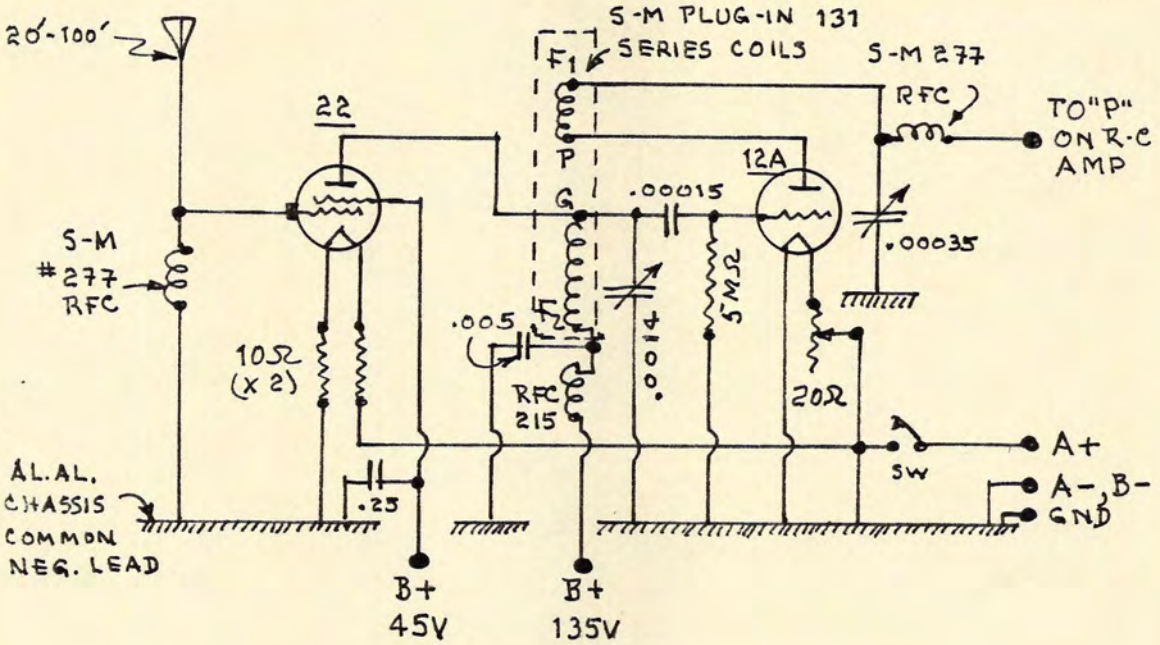




A SHORT-WAVE RECEIVER of 1930

S-M 731 SHORT-WAVE ADAPTER, 1928
(See Also S-M "Round-the-World 4")

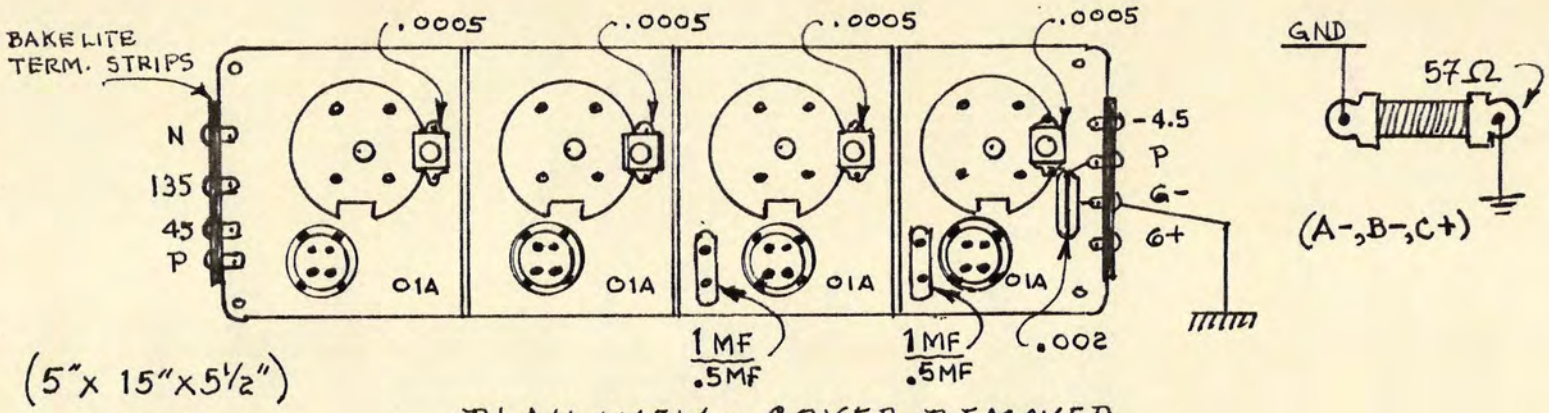




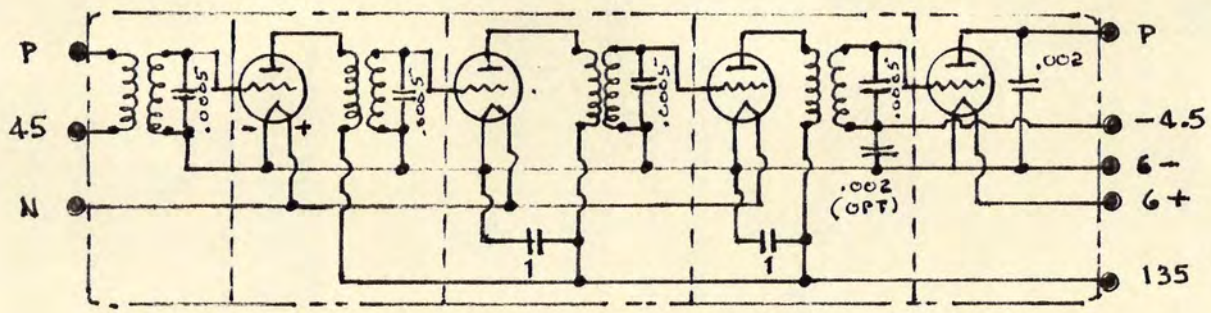
TUNING:

1. 20-Ω knob w/ Arrow straight up.
2. Turn RH dial until a plunk is heard.
3. Turn LH dial until a squeal is heard.
4. Adjust L.H dial for lowest pitch.
5. Adjust RH dial just below the squeal.
6. Signal can now be heard.
7. VOL is controlled by RH dial; 20Ω rheostat controls FIL only for DET.
8. May be plugged into DET sckt. of BC set.

(CB Win-28)



PLAN VIEW ~ COVER REMOVED

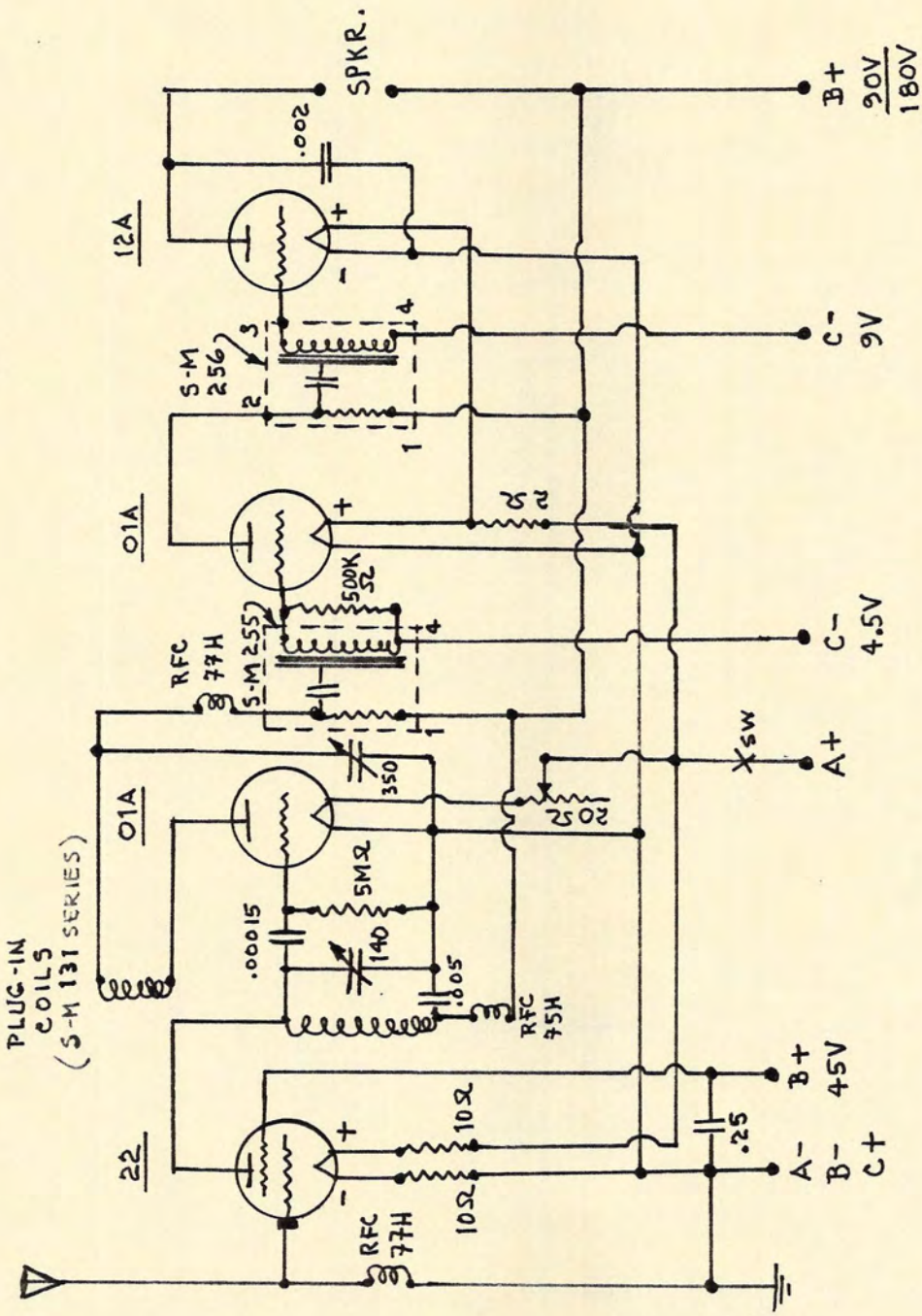


SILVER-MARSHALL 112KC AMPLIFIER, 1927

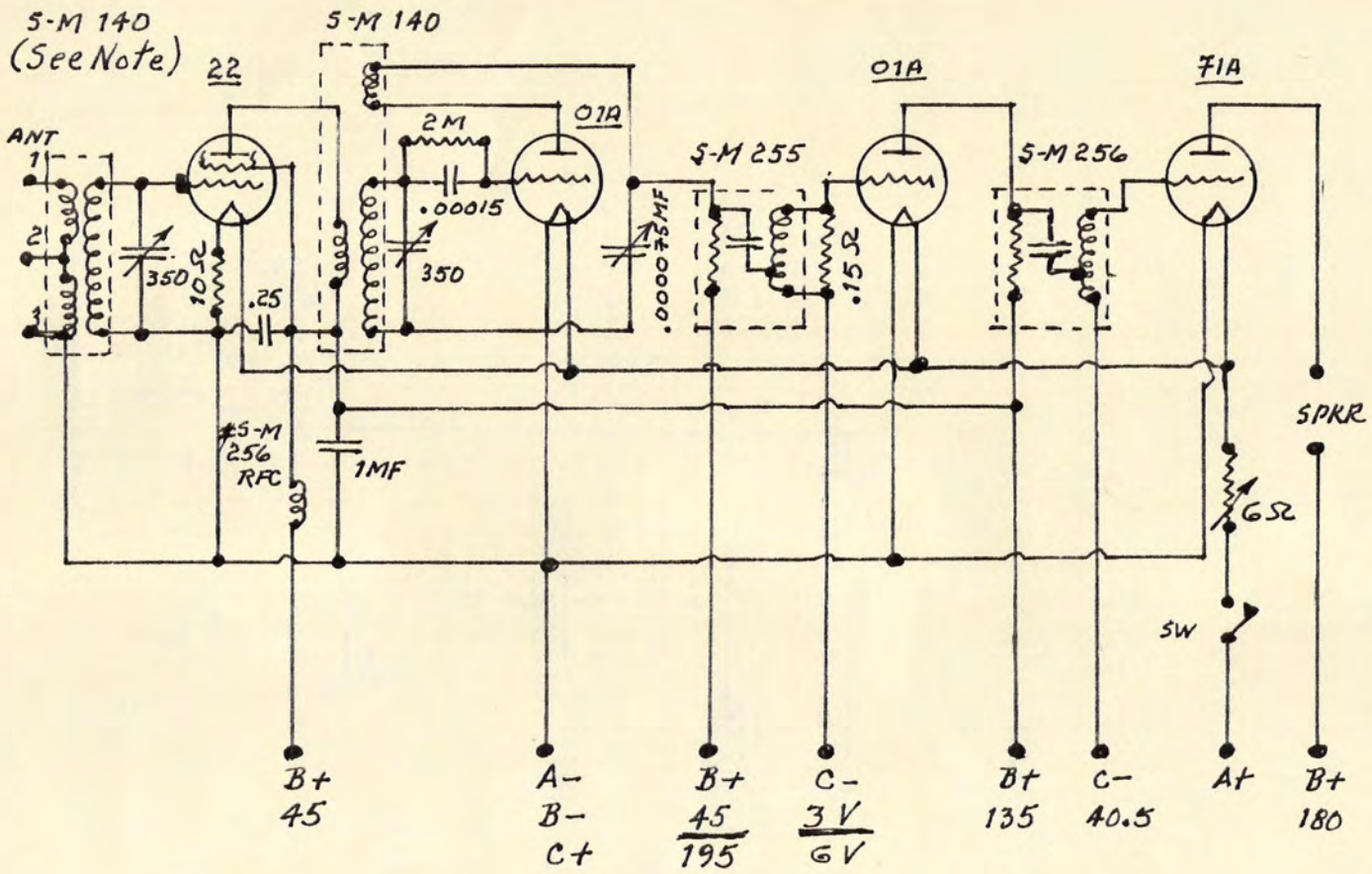
NOTES:
1. Later version used (3) 22 and (1) 200A; along with a 10-ohm resistor in the negative leg of the 22 and an additional .5 capacitor.
2. This was essentially a high-grade amplifier for IF; Remler's was better.
3. The first S-M 112KC Time Signal Amplifier, for which this unit was designed, proved commercially unfeasible. The design eventually emerged as the 620 S.G.

(GND connexion to any receiver using this unit must add the configuration shown in upper right-hand corner of this sheet.)

S-M "R.T.W.F.", 1929 VERSION



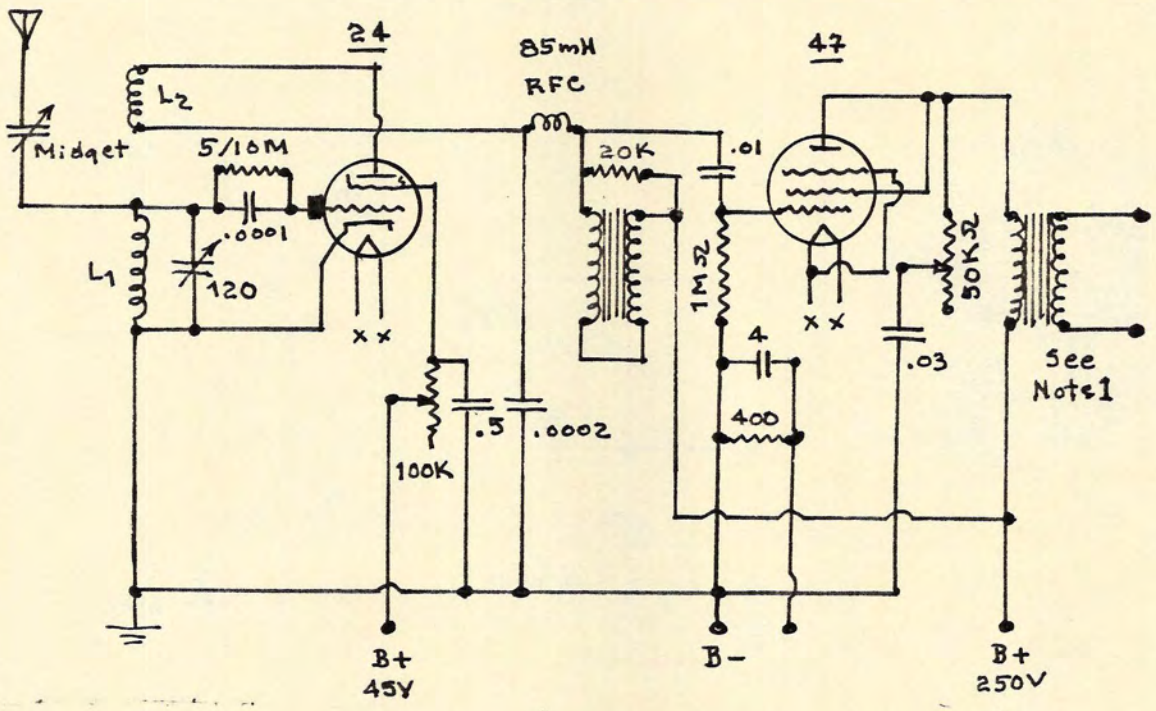
SILVER-MARSHALL 740 "COAST-TO-COAST" (1928)



Metal cabinet, 7" x 7" x 14".

S-M 140 Series coils are/were universal coils, with one having windings connected in series with the ANT.

TWO-TUBE SHORT-WAVE RECEIVER, 1931



NOTES:

1. Pentode AF output xfrmr. Required.
2. Coils wound on tube bases.
3. COIL DATA:

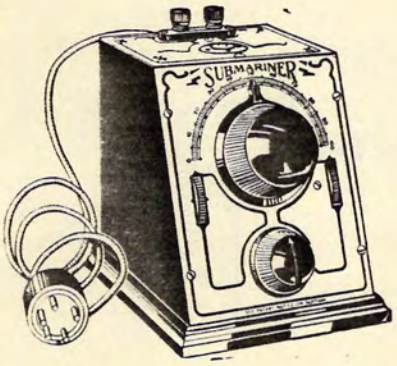
L1 = 11T #28 DCC
(20-40 Meters)
L2 = 6T #28 DCC

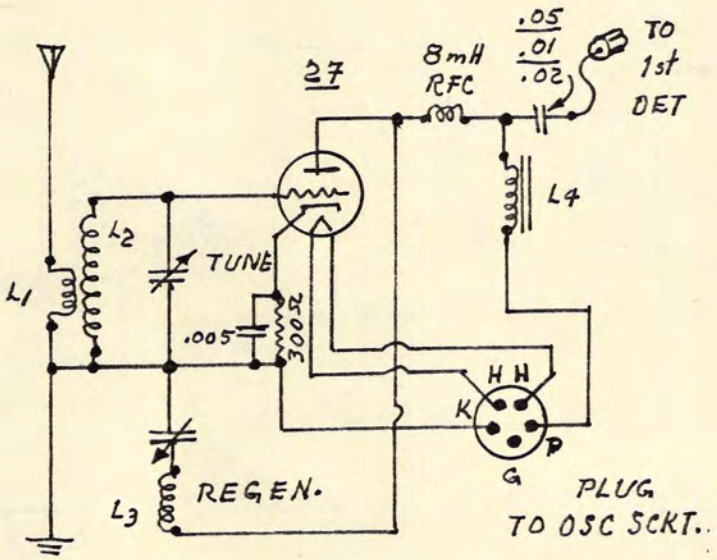
L1 = 20T #28 DCC
(40-80 Meters)
L2 = 9T #28 DCC

Table Size
27½ x 18½ x 12 deep.
($26.50)

(RCB 4-32)

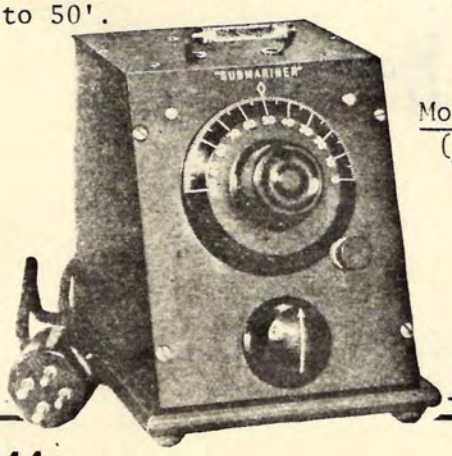
"SUBMARINER" Model 2 SW. CONVERTER,'27





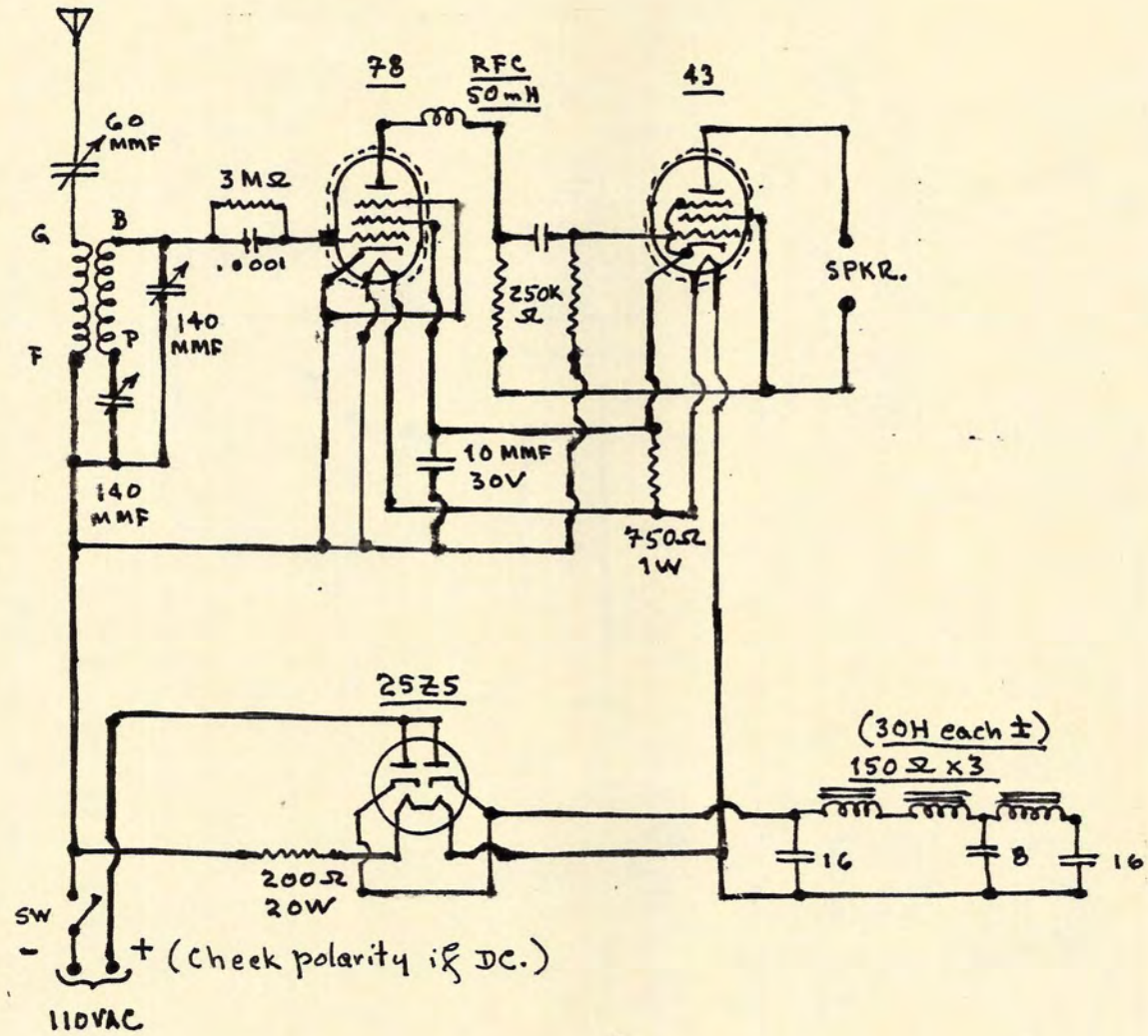
NOTES:

1. Unit is essentially a coupling device for 175 KC.
2. Coils were plugged into back of unit; 3-Windings.
3. Volume controlled at the receiver.
4. If rcvr, has a Local-Distance switch, set at Distance.
5. Remove OSC. tube from rcvr. and place on unit.
6. Remove grid-cap from 1st DET; connect to unit grid-cap.
7. Insulate grid-cap from 1st DET in rcvr.
8. Tuning dial had a 64:1 ratio.
9. Regeneration control was a midget 25mmfd variable.
10. Tuning variable could be 100/140/350 MMFD.
11. L4 & .01/.02 capacitor = impedance device (the "J" feature).
12. Antenna could be 30' to 50'.



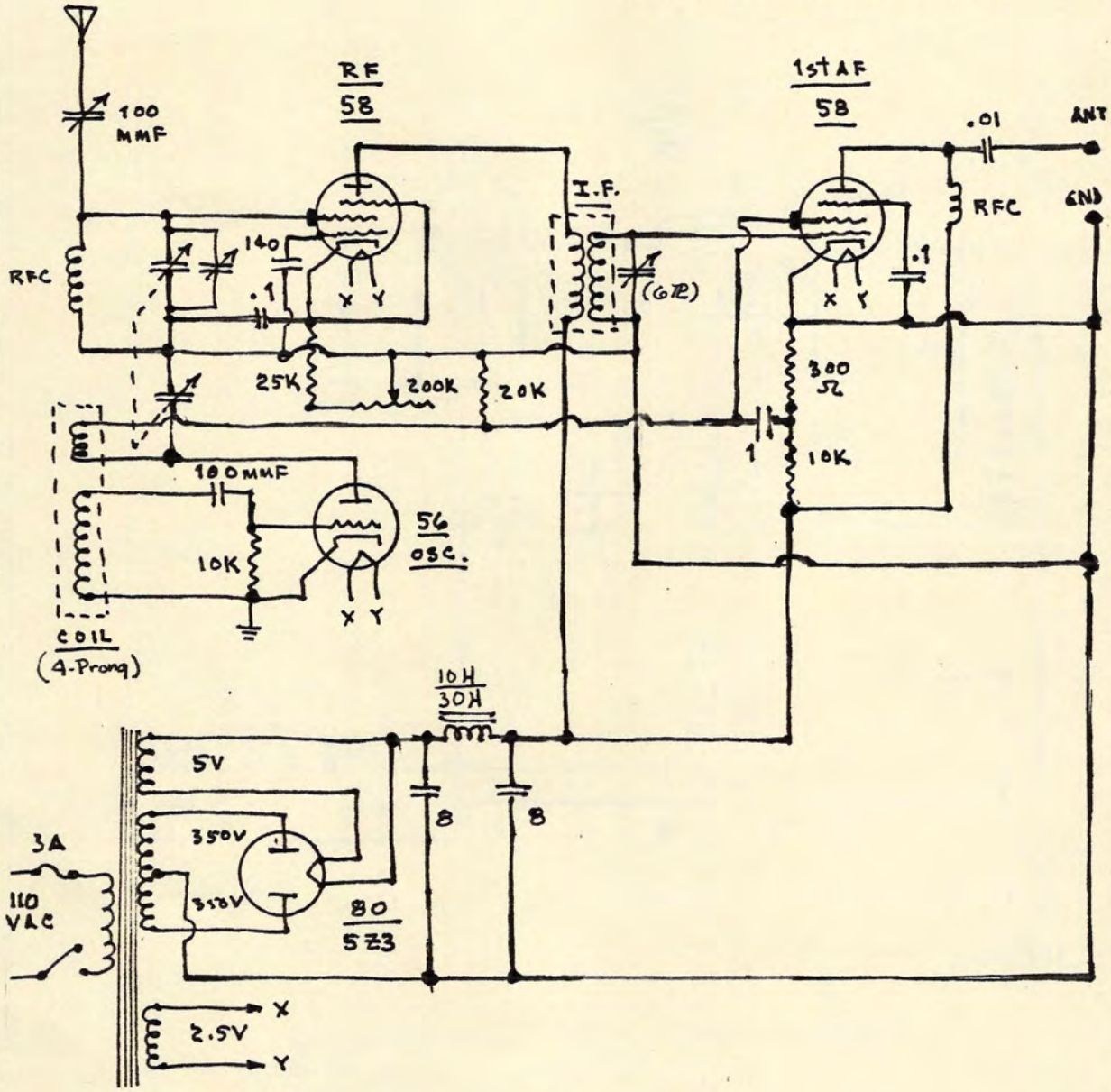
Model 1
(1926)

TRY-MO PORTABLE SHORT-WAVE RECEIVER, 1933
(AC - DC)



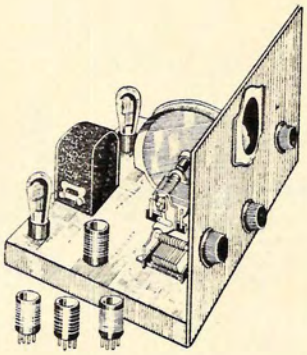
NOTES:
1. With DC input, observe polarity!
2. Tube shields required for 43 and 78 tubes.
3. (3) 6-Contact sockets for tubes.
4. 4-Contact socket for Coil.
5. Polarity precaution not applicable to AC input.

TRY-MO SW. CONVERTER, 1934



NOTES:

1. This unit was also marketted under the names of ADAMS and COSMAN.
2. Unit similar to MID-WEST Model C-4, 1932, q.v.
3. Each variable condenser = 6 plates.



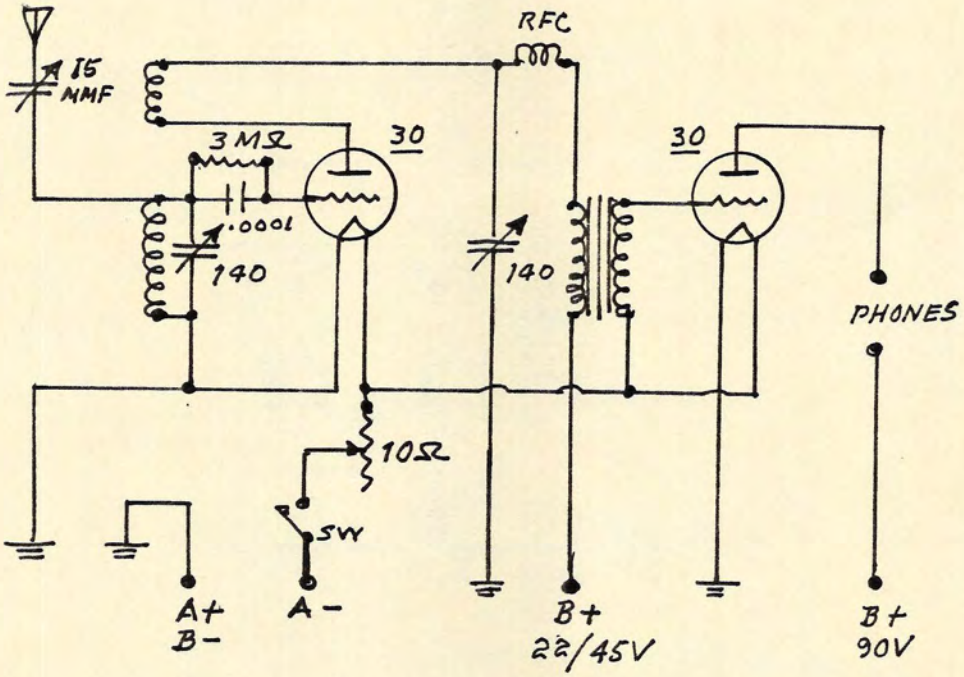
TRY-MO'S "BEGINNER'S TWIN"
(1932)

Range = 15 to 200 Meters

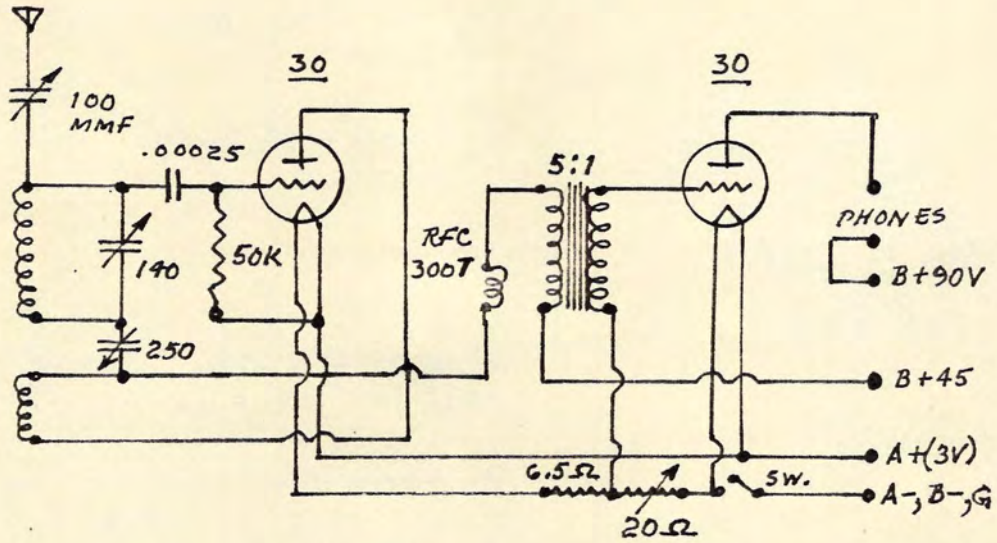
PANEL = 8" x 10¾" (Alum. Al.)
BASE = (same as Panel)

(2) Hammarlund 140 mmf Variables.
" Vernier Drum Dial.
Original Plug-In Coils were "Powertest", mfgd. by TRY-MO RADIO, N.Y.C.
AF Xfrmr. = 5:1, any make.

Chassis was GND.

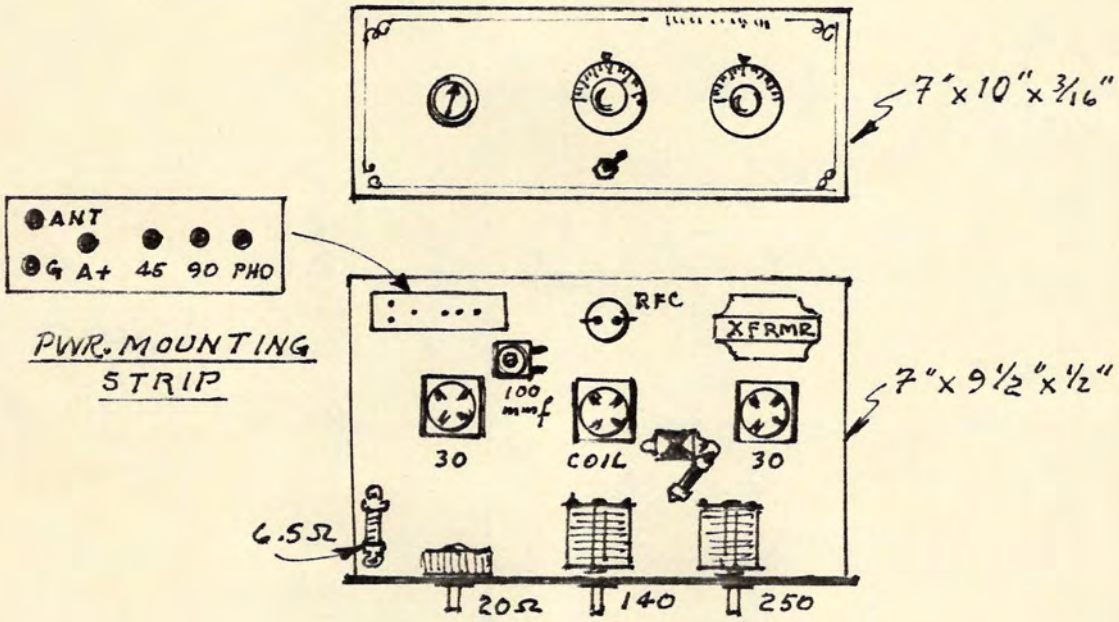


TULLY SW. RECEIVER, 1932 (Kit)



Additional AF Stage may be added for SPKR.

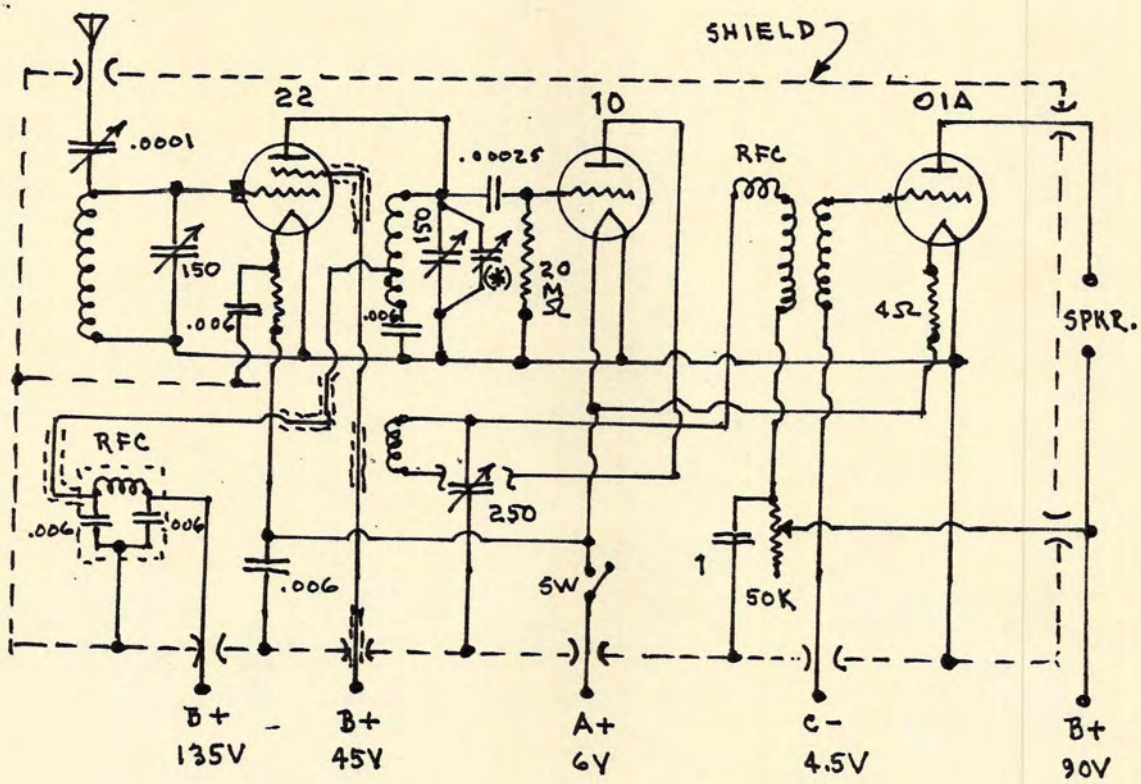
Originally kitted by RADIO GOODS, NYC, @ $12.



NOTE: Any Commercial 4-Prong SW. Coil Set Could Be Used.

(RW 2·27/4·2·32)

WALLACE SHORT-WAVE RECEIVER, 1928

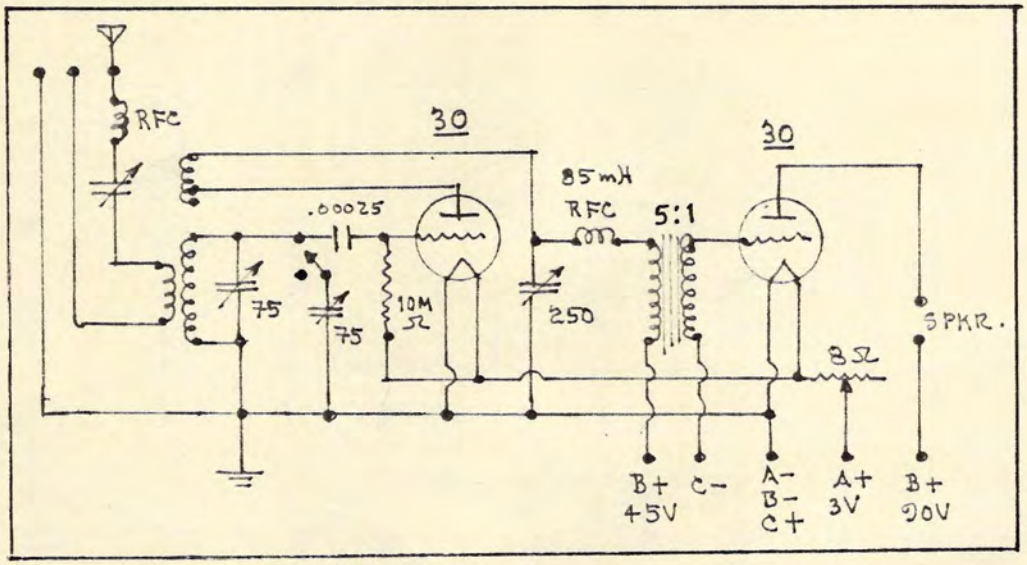


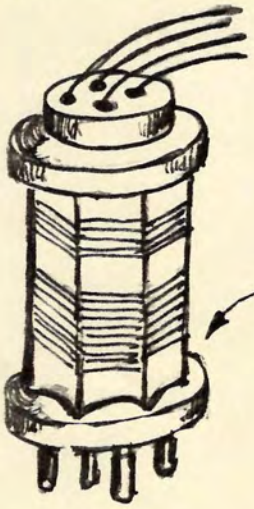
GENERAL NOTES

1. Shielding is copper.
2. Shield is ground.
3. AERO coils may be used.
4. Batteries grounded to shield.
5. 20-Megohm grid-leak must be able to handle grid current of the 10 tube.

(*) = This was a 1-plate midget variable.

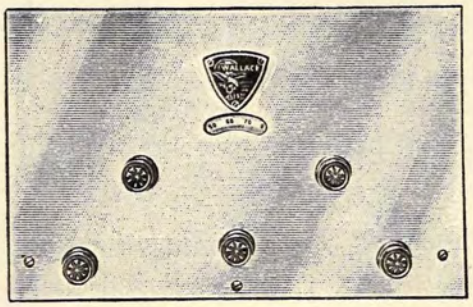
WALLACE SW RECEIVER, 1932

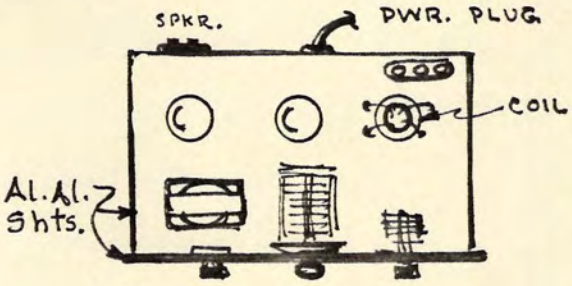




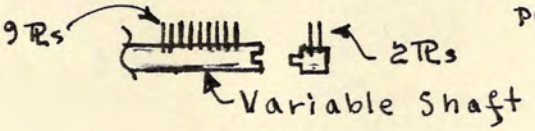
COIL REQUIRES AN 8-TERMINAL SOCKET.

WALLACE COMBINED S.W. COIL





75 MMF BAND-SPREAD VARIABLE IS IN TWO SEXIONS: PUSH TO ENGAGE.



SW. CONVERTER RESUMÉ

Short-wave receiving apparatus falls into three catagories:

1. SW. RECEIVER: a complete specialised unit designed to be highly efficient at high frequencies;

2. ALL-WAVE RECEIVER: usually a super-het, designed for the reception of both BC and SW programs, by means of either plug-in coils or a coil-switching mechanism;

3. ADAPTER/CONVERTER: an accessory which, when attached to a long-wave receiver, makes a combination capable of reproducing short-waves.

The adapter has, generally, a circuit utilising only the AF sexion of the receiver.

The converter, properly, is a frequency changer, and uses a part of the RF channels within the circuit.

The adapter feeds a detected signal into the BC receiver at the DET input or output, and usually derives its power from the set.

The converter, ordinarily, is self-powered. It connects the input terminals of the BC receiver - ANT and GND. It converts a SW. ferquency into a broadcast frequency, utilising the super-het principle of operation. The converter may be constructed with or without a signal frequency-tuned input circuit.

It will be realised, therefore, that the SW. converter consists essentially of a tuned local oscillator and a modulator, or a 1st DET. The oscillator heterodynes with different incoming SW signals, resulting in a constant beat-note for any setting of the oscillator, or of both oscillator and tuning control.

The converter's output terminal is connected to the ANT of the receiver, which is tuned to this beat-note, or difference which may lie between 199 and 600 meters, depending on the design used in the converter.

Some converters employ an RF stage or signal-frequency amplification, tuned or untuned, ahead of the oscillator and first DET

which is a desirable feature. Converters do not work too well with a super-het, unless there is some amplification ahead of the first DET. With a stage of amplification following the converter output, amplification of the beat-note or beat-frequency may be to 1500 KC.

Two main methods of changing the tuning band were used in the early converters. One employed a coil tap-switch; the other, plug-in coils. Contacts, in either case, were highly critical and had to be kept scrupulously clean. No converter would improve the sensitivity or selectivity of the receiver, contrary to some.

Generally, the receiver's dials should be set at around 1500 KC., and only the converter's tuning dial adjusted to tune in a signal. If a BC signal was found at around 1500 KC., the receiver dial had to be shifted to a higher setting.

With the converter, receiver, and power supply turned on, a rushing sound should be heard. If not, the receiver's VOL control is adjusted to control circuit oscillation, which may exist in the set. It would be evident as a feeble hiss or a lack of SW signal.

The converter's tuning dial should be tuned with extreme and delicate care. A vernier dial was and is highly desirable, with gear ratios as high as possible, such as the Accuratune 80:1 dial made by the Mydar people in 1926. The converter dial divisions cover 100KC as opposed by the 10 KC. of the BC receiver.

The converters would sometimes act simply as a BC signal intensifiers. This was because the oscillator of the converter was not peaking. Tubes were immediately checked, and if found to be good, a check of plate and FIL voltages was next. If a B-eliminator was used the rectifier and electrolytics were checked. If a hum was present a modulation of the beat-frequency would occur, making tuning hard.

* * *
* *
*

Beyond Rider!

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